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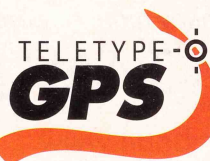
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- Pocket PC Magazine

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What a year. We could name 400 products that made us giddy in 2002—dirt-cheap Pocket PCs, amazingly versatile MP3 players, just about everything from Sony, and so on—but our mean old publisher balked at printing a Sears catalog-size issue. So we whittled the list to 40—and not without some mug-slinging arguments, mind you—to give you the absolute cream of the handheld crop.

### 42 Pocket PC Bargains

Hey, when did “low cost” and “Pocket PC” find their way into the same sentence? Very recently, with industry heavyweights like Dell, ViewSonic, and Toshiba slapping decidedly Palm-like prices on their new handhelds. What kind of Pocket PC can you get for \$299—even \$199? You may be surprised.

### 46 PDA Power: Home Theater

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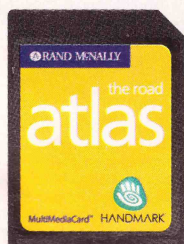
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# Half-Decade of Handhelds

**A**s *Handheld Computing Magazine* enters its sixth year, we thought it would be fun to take a look back at the very first issue. Wow, how things have changed. Printed in glorious black, white, and green, *Tap* 1.0 (the magazine's original moniker) sported a whopping 12 pages, for the same \$4.95 cover price as the magazine you're holding now.

*Tap* was devoted completely to the PalmPilot and its IBM Workpad clone. Handspring didn't yet exist, Sony hadn't yet coined the term Clie, and the first-generation Windows CE/Handheld PC 1.0 devices of the day... still needed work. (Microsoft finally got it right years later with version 3.0, pretty typical of the company's track record.) The hot new \$399 Palm Pilot Professional sported a whopping 1MB of memory and had such

Of course, we knew better. Editor Rick Broida's feature "Broadcast News" focused on how to connect to the net using your PalmPilot. The most innovative device covered was the upcoming Novatel Minstrel modem, a \$399 clip-on sled that would let you access the Net wirelessly. Just \$99 each month would net you a 1.5MB of data transfer. Always ahead of the curve, we also featured an article on how to connect a keyboard to your PalmPilot, a full year before Landware released the GoType.

## Fast Forward

My, how the market has changed in the last half-decade. Many of the handheld applications highlighted in our "Top 40 Products of 2002" feature this month are more powerful than the desktop computer apps of 1997. As optimistic as we were back then, we weren't prognosticating handhelds like the Clie NX70V with a built-in digital camera and the ability to hold multiple CDs worth of digital music. And while we might have dreamed about a pocket-sized wireless phone/PDA combo like the T-Mobile Sidekick, we certainly wouldn't have guessed you'd be able to get one for just \$200.

With Dell's recent release of a full-featured, no-compromise Pocket PC for just \$199 (after rebate), we expect to see even more dramatic changes. Will Dell's entry in the market stifle innovation by forcing price wars, or will other handheld manufacturers respond with enticing new designs to justify higher prices? Will wireless finally become ubiquitous? How will smartphones fit into the picture? And will Sony's upcoming top-secret PDA announcement cause an even bigger stir than Dell's Axim?

Watch these pages over the next five years to find out.

**Denny Atkin**  
Editor-in-Chief  
denny@hhcmag.com

The cover of *Tap* 1.0 magazine features a PalmPilot device. The text on the cover includes: "TAP 1.0", "The #1 Resource for PalmPilot and Workpad Users", "FAX! E-MAIL! THE WEB!", "Do It All With Tap's Ultimate Guide to PalmPilot Communications!", and "Plus! An Exclusive Report on the New 3Com/Motorola Pager Card! The Pilot Newspaper Daily".

innovative features as a backlit screen and the ability to connect to the Internet using a clip-on modem. The "low cost PDA" market consisted entirely of the 512K Palm Pilot Personal, a \$299 handheld which omitted the Internet connectivity—a feature Palm must have thought was sure to appeal only to businesses.

## HANDHELD computing™

**Publisher** Andrew Eisenberg / andrew@hhmgroup.com  
**Editor-in-Chief** Denny Atkin / denny@hhcmag.com  
**Editor** Rick Broida / rick@hhmgroup.com  
**Contributing Writers** David Haskin, Dave Johnson,  
**Copy Editor** Dawn Jepsen  
**Art and Production Director** Connie Bigelow  
**Digital Artists** Margaret Gomez, Mark West  
**News/Product Announcements** editor@hhcmag.com  
**Letters to the Editor** letters@hhmgroup.com

### EDITORIAL OFFICE

Handheld Computing  
41 Bacon Drive  
Shelburne, VT 05482

### CORPORATE & ADMINISTRATIVE OFFICES

Handheld Media Group, Inc.  
1670 South Amphetlett Blvd. • Suite 214  
San Mateo, CA 94402  
p 650.378.8522 / f 650.378.8513

### Chief Executive Officer

Andrew Eisenberg  
andrew@hhmgroup.com

### Marketing Managers

Michael Bergen / michael@hhmgroup.com  
Shiloh Rusk / shiloh@hhmgroup.com

### Advertising Account Managers

Stephen Davis / stephen@hhmgroup.com  
Christy Eisenberg / christy@hhmgroup.com  
Jim Fox / jim@hhmgroup.com  
p 650.378.8522 / f 650.378.8513

### Subscription Questions and Address Changes

Handheld Computing™  
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# Mailbox

## Praise the Mute Button

Okay, so I was reading Rick and Dave's argument covering Bluetooth and Wi-Fi in my boyfriend's current subscription to *Handheld Computing* (You can thank me later—I'm the one that paid for the subscription) and I just *had* to weigh in on this argument. Ask my boyfriend—I'm good at weighing in on arguments.

Re: Bluetooth. I love it. I'm a nurse that works in a busy hospital ICU that decided *oh so wisely* to install this technology throughout the hospital. They provided the doctors with individual tablets to carry around the hospital with them, write out orders, download labs, and basically get them to stop asking *me* to be their secretary and allow me to actually take care of their patients. *Hooray* for technology I say—it's about time. The old technologically challenged doctors—and nurses as well—find it somewhat intimidating, but they'll get over it eventually. These are the people who finally opted to buy microwave ovens circa 1990, I think. This too shall pass.

As for the *Star Trek: Voyager* argument, I liked *Voyager* the best. And since I am a heterosexual female, it had nothing to do with the nuclear warheads on 7 of 9's chest. Chakotay had the sexiest tattoo imaginable, and I really liked the holographic doctor who had (dare I dream?) a *mute* button! Every time Captain Janeway had him silenced, a subtle warmth would perfuse my being (not to be confused with the subtle warmth generated by my boyfriend, who wants his magazine back). It all goes back to that age-old argument: "What's the difference between God and a cardiologist? God doesn't claim to be a cardiologist."

Enough. Does anyone ever really listen to a nurse anyway? Turn your head and cough... Oh wait, that's a different e-mail entirely...

Best of luck, guys. May the best smart aleck win.

—NotJustAnyNurse in Arizona

## Reader Top Picks

The iPod, hands down, is the greatest handheld device that's been introduced in the last year. I can carry around enough music for several days, and it syncs with my PowerBook with no fuss. While I do have appointments and contacts there, I have never needed them, since I usually have a Palm, but for driving, walking, or biking, the iPod has given me a totally seamless connection to my music library. For the past few years, I've put all the CD's I buy onto my hard drive and listen from there. With the iPod, I no longer have to manually choose a few songs to listen to like I did with my Rio. I just plug it in and let it sync, and I know I'll have a large chunk of tunes whenever I want them.

—T. Smythe Richbourge

Best Handheld: Apple iPod, because people have done amazing things to expand this from being a simple MP3 player. It shows you what building a no-holds barred MP3 player can bring you: a classic.

Best Software (game): Astraware Bejeweled. Is it me or has every puzzle game for the Palm since worked frighteningly like this simple, yet addictive game?

Best Software (utility): nosleep.net Filez. This program lets me fix mistakes, move files from the Palm to my expansion card better than Palm's own tools. The fact that it's freeware makes it even better!

Best Software (organizational): Iambic Agendus. This program supports just about every Palm compatible handheld out there, and consistently adds just the right mix of new features and bug fixes with each timely update.

—Kyle Demilo

Not long ago, I wished in a letter to you for a Palm OS device with a high resolution screen and an improved

software package that still operated on AAA batteries. I believe my ship arrived in the form of a Sony Clie PEG SL10. It does about everything I wished for, except retain a larger screen like my Palm IIIxe. Good price, too! The new Clie makes nice work of the spreadsheets from my Quickoffice 6.2 suite. It worked so well for me that I have bought an additional copy of Quickoffice to give as a gift to my accountant. What a combination! Improved power in the software, coupled with a hi-res display that can show the results! So, those are my votes: Clie SL10 for value and utility, and Quickoffice 6.2 for versatility.

—Lou Toth

Regarding your request for best PDA nominations, it's got to be my new Treo 300. I had been a Palm m505 user for some time while I waited for something much better to come along—something that represented a generational improvement. Along the way, I made the mistake of purchasing the Nokia 9290, a PDA phone with Voicestream service. What a gigantic mistake. I could bore you with the details regarding the Nokia's shortcomings, but I won't. Suffice it to say I returned it to CompUSA, suffered the 10% repackaging penalty (which means I'll never again buy something from them), and returned to waiting for the Treo. I finally have it, and it's a gem. No bugs. It does everything I need it to do, and the Sprint service, which I've used for years, has never given me a problem.

—Bill Howard

I use Tapperware's My Roots for Genealogy research. It is very easy to add people and event as well follow a tree-line. I am always showing it off to friends and family. I find My Roots extremely useful and a perfect reason for owning a Palm Pilot.

—Randy Shaw



What do you think? Send your thoughts to [letters@hhcmag.com](mailto:letters@hhcmag.com). Please include your full name and e-mail address. Letters may be edited for length and clarity.

### The Doctors Prescribe...

I am a family physician in Syracuse, NY and a member of the Department of Family Medicine. I would like to nominate *Skyscape* for this year's best medical software. I have been using their products for the past 4 years. Despite all of the recent new software available and new companies starting in this area, Skyscape continues to lead the pack.

First, they have excellent support and very user-friendly service structure. Correspondence is prompt and updates come via e-mail often. Second, their medical software applications are the best on the market. The number of available resources continues to expand daily. One of their best features is a "link" button that will automatically search another resource

for the same or similar type of information one is reading in a current book. For example, if I am in 5M Emergency Medicine (5MER) and am looking up pharyngitis and need the dose of the antibiotic that is recommended in the 5MER, I can select the "link" option and it will suggest the antibiotics listed in 5MER and then go to the drug database of my choice and it will automatically look for the antibiotic I selected.

Lastly, being in academics, I have asked *Skyscape* for some customization features so I can do research on access to information by medical students. They have been very willing to accommodate me and help in the advancement and improvement of disseminating high quality and useful applications right

where it is needed: in the hands of our students and at the bedside. By having this information available at the "point-of-care," they can instantly access vital information important to appropriate medical decision-making that would have otherwise been housed in a library or at a computer desktop. PDAs are becoming ever popular in replacing the volumes of coat-pocket texts that used to bulge at the seams in students white coats.

—R. Eugene Bailey, MD

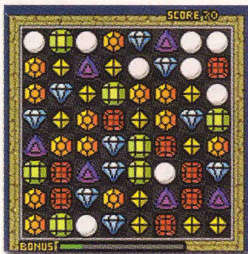
We received a number of reader nominations for *Skyscape*, from doctors and students alike. For detailed coverage on the use of handhelds in medicine, be sure to check out our sister magazine, *Handheld Computing Mobility*. See [www.hhcmag.com](http://www.hhcmag.com) for info.

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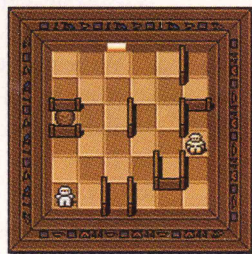
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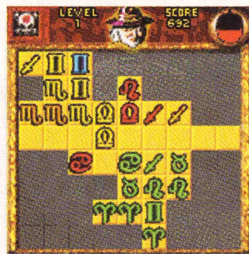
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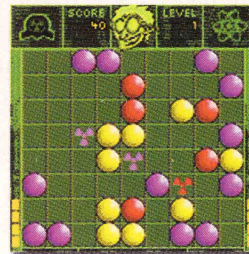
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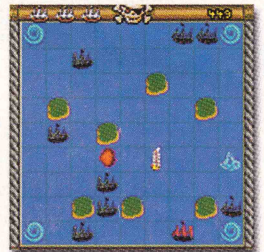
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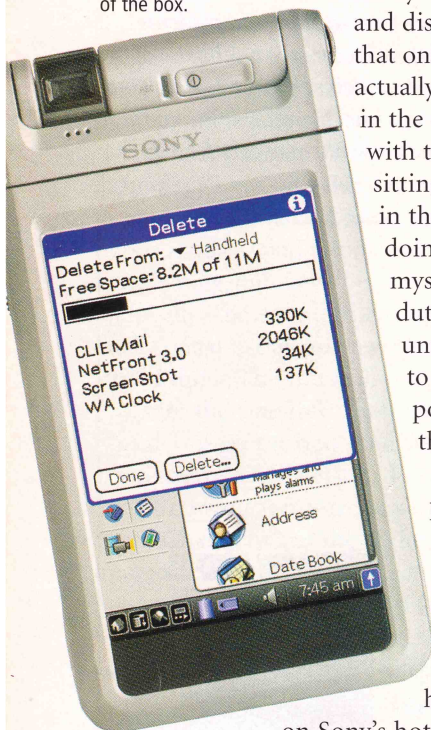


# New!

## Where'd My Memory Go?

There's a new tire to kick when making a PDA purchase: Check how much memory is really available for programs and data. Some new PDAs advertise a certain amount of available memory, but when you install programs, you'll discover that only about 2/3 of the RAM in the handheld is actually usable.

Sony Clie NX70V, 16MB with 11MB available out of the box.



It's akin to buying a new six-cylinder car and discovering that only four are actually installed in the engine, with two more sitting back in the trunk doing some mysterious duty that's unrelated to actually powering the car.

This problem first came to light when we got our hands

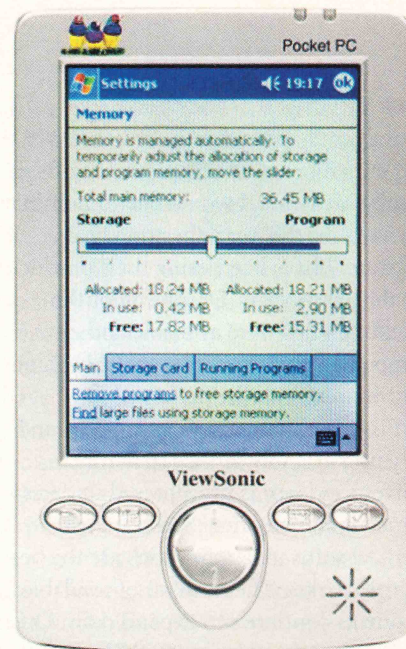
on Sony's hot new Clie PEG-NX70V. Despite the inclusion of 16MB of memory in the unit, there's a mere 11MB free with no software installed. Sure, Sony loads the device with useful software, but that's in ROM (Read Only Memory), so it shouldn't take up RAM, right? Yet it does. Thus, your hot new NX70V doesn't store much more data than an older 8MB device.

It turns out that the "missing" 5MB is set aside for use as workspace (or "heap space," for the technically minded

out there) by the various built-in applications on the NX70V. The applications on the NX70V have an unprecedented level of integration—you can shoot images instantly between Clie Camera, Photo Editor, and even the Address Book, for instance—and this integration requires Sony to set aside 4MB to use as "workspace." Another megabyte is used for general operating system housekeeping, leaving 11MB free. To Sony's credit, while some of the product literature and comparison charts list 16MB of memory, the online spec sheets do specifically state "16MB, 11MB Available." You might wonder why Sony didn't simply include more RAM in the NX70V; our initial investigations indicate that Palm OS 5.0 may be saddled with a 16MB RAM limit, perhaps due to the nature of its emulation of earlier Palm OS devices.

This isn't just a problem faced by Palm OS users. We were initially impressed with our look at Viewsonic's new \$299 V35 Pocket PC. But when we went to check the memory on the unit, we found a mere 36.45MB of RAM was available for storage on the device, with a whopping 27.5MB being reserved by the Pocket PC OS. Thus, this 64MB handheld offers little more RAM storage than your typical 32MB unit. To Viewsonic's credit, after we first broke this story on our PDABuzz.com news site, the company revised its Web site to read "64MB SDRAM (36.45MB user accessible)." Many online retailers, however, continued to simply list "64MB SDRAM."

HP's new low-cost iPAQ h1910 also reserves a 16MB chunk of memory for the OS, but the company has been forthcoming about this from the start, listing the memory as "48MB available" in various press releases and spec sheets.



Viewsonic V35, 64MB with 36.45MB available, plus 5.2MB of flash memory.

Again, however, some retailers list the specifications as "64MB RAM."

According to HP's FAQ for the h1910, the less expensive read-only memory used in the h1910 doesn't offer "execute-in-place" support, which means that the ROM data must be copied to RAM while you're using the PDA. We'd guess that this is the problem plaguing the Viewsonic V35 as well.

Whatever the explanation, the fact remains that users with lots of data or who want to run numerous third-party programs will want to be sure to do some research on how much memory is really available before making a new PDA purchase.

We're glad to see PDA manufacturers starting to list the actual amount of available memory on their handhelds; we hope they'll encourage retailers to follow suit in their advertising. When we were talking about 7MB free on an 8MB unit, the reserved memory was just annoying. But with 30% or more memory unavailable in some newer units, this starts to become a serious limitation.



## Clié Contest Offers Cash for CompactFlash Drivers

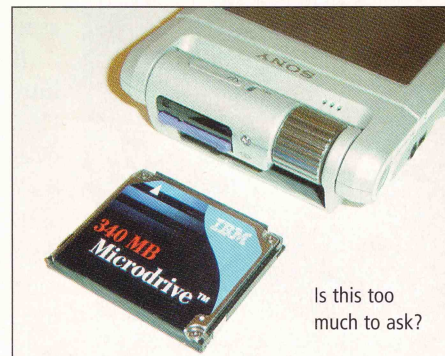
Perhaps the single biggest criticism of Sony's otherwise groundbreaking Clie NX (see review in this issue) is its "Communications" slot. Though apparently derived from industry-standard CompactFlash (CF) technology, the slot doesn't recognize CF memory cards or devices. For the moment, the one and only peripheral it can host is Sony's PEGA-WL100, a wireless Wi-Fi LAN card. (Interestingly, the Japanese version of the NX also supports a few CompactFlash modems, but the support libraries needed to do this aren't present on the US version.)

This begs the question: is the slot physically crippled in some way, or did Sony simply choose not to include drivers for CF accessories? Sony won't comment,

but the people who run the fan-site ClieSource ([www.cliesource.com](http://www.cliesource.com)) think it's the latter. Thus they created the Clie NX-Series CompactFlash Memory Driver Contest. The first programmer to submit working drivers before the January 3 deadline wins the prize: cold hard cash, all of it contributed by Clie users eager to see this limitation overcome. At press time, the PayPal-hosted prize fund had reached \$1,483.65, with contributions ranging from 50 cents to \$200.

Why the keen—and fiscal—interest in support for CF memory media? In a word, capacity. You can buy CF cards that hold 256MB, 512MB, even 1GB of data. Memory Stick media, on the other hand,

tops out at 128MB. Given the NX's unparalleled music and video capabilities, that's just not enough storage space. Thus, here's hoping the contest is a rousing success. Our contribution is on the way.



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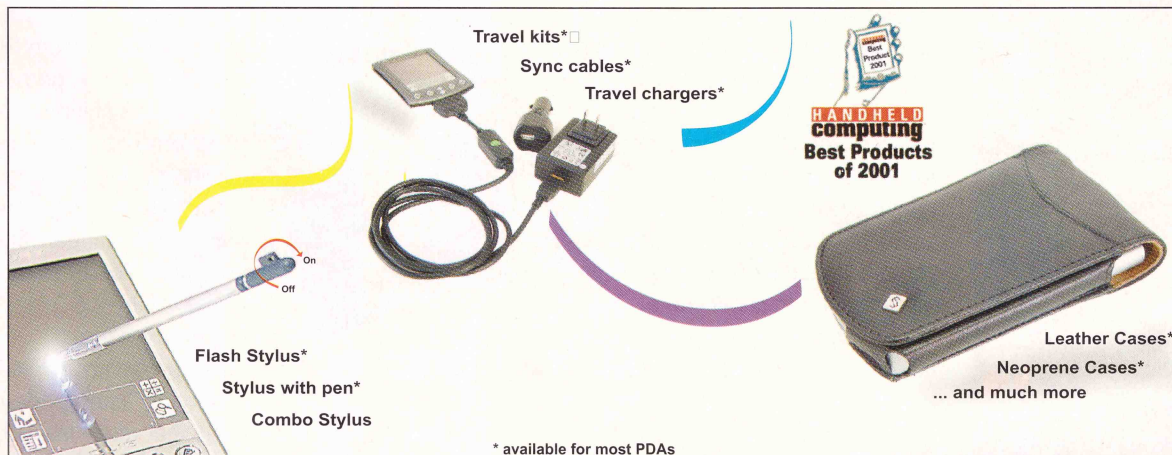


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## Palm Powered News

For years, users of the popular ACT! contact manager have had to rely on a less-than-stellar conduit to synchronize their data with their handhelds. At long last, Best Software brings ACT! itself to the Palm OS. The software lets you synchronize over 60 predefined and 15 custom fields; store multiple addresses, phone numbers, and other info for each contact; and record histories, activities, sales opportunities, and date- and time-stamped notes. **ACT! for Palm OS** ([www.act.com](http://www.act.com)) costs \$60.

Speaking of contact management, fans of Iambic's Agendus (formerly Action Names) may want to check out its new desktop counterpart: **Agendus for Windows** ([www.iambic.com](http://www.iambic.com)). Resembling a cross between Palm Desktop and Microsoft Outlook, Agendus is compatible with both and brings all the capabilities of the Palm OS version to your PC. Owners of Agendus for Palm can buy it for \$29.95; it's \$39.95 for everyone else.

Homeopathy continues to gain popularity as an alternative to conventional medicine. **Pocket Homeopath** ([www.herbselect.com](http://www.herbselect.com)) aims to cure what ails you; just select your symptoms from six major categories and the software provides a list of applicable remedies. It also lets you search indexes based on therapies, first-aid, and children's illnesses. The \$24.95 program might be just what the doctor ordered.

# new!

## Palm's Latest Licensee Goes for the Wrist

Fossil, a company best known for its watches, purses, and sunglasses, has become the latest official licensee of the Palm Operating System. No, they're not developing the "purse PDA"—rather, the company has unveiled the Wrist PDA with Palm OS, a sleek wristwatch with as much power as a Palm Zire.

If this sounds a bit familiar, it's because Fossil introduced an eponymous product earlier in 2002. However, the original Wrist PDA didn't run the Palm OS; it was designed to let you beam data from your handheld. It also had the bulky, unattractive design of an early-80s digital watch, and the worst interface imaginable.

Fortunately, the new model looks like an improvement on every level, from its sleek silver design to its illuminated touchscreen LCD. The Wrist PDA also sports 2MB of internal memory, a three-way rocker switch for easy navigation, a rechargeable battery, and an infrared port. We particularly like the stylus, which is cleverly integrated into the wristband, James Bond-style. Palm OS 4.1 delivers the usual preloaded apps, plus compatibility with third-party software. In short, it's a Palm on your wrist.

Fossil will launch the Wrist PDA with Palm OS under two brands, Fossil and Abacus, the latter a new tech brand designed for distribution in the electronics market. Both versions are scheduled to be available in stores in the United States and internationally by mid-2003. Prices will range from \$200-300.



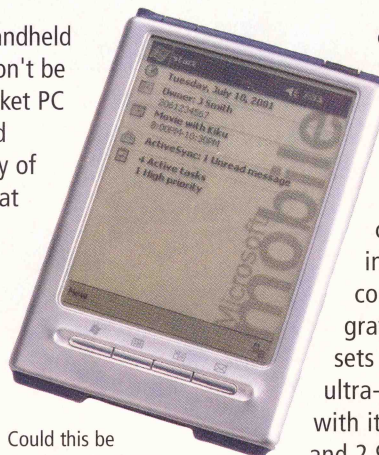
This time around, Fossil's smart wristwatch is a full-powered Palm OS PDA.

## How Low Can Pocket PC Prices Go?

Looks like Dell's new \$199 Axim handheld (see related stories in this issue) won't be the lowest end for the low-end Pocket PC market. In November, Microsoft and Samsung announced the availability of a new Pocket PC concept design that "dramatically lowers costs and reduces product development time for mobile device OEMs and original device manufacturers."

So, just how low a cost are we talking about? Company reps have yet to comment on that point, but a grayscale model would likely sell for \$150 or less (based on the availability of Dell's \$199 color handheld).

The new design incorporates a Samsung ARM9-based S3C2410 application processor and a 3.5-inch quarter-VGA grayscale or



Could this be the face of a \$150 Pocket PC? Time will tell.

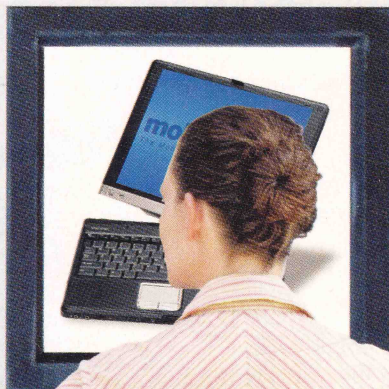
color display. To enhance multimedia functionality, multimedia card (MMC), Secure Digital and SDIO expansion card capabilities are incorporated into the concept design. The grayscale version, at least, sets a new standard for ultra-small Pocket PC devices with its 4.1-by-2.8-inch size and 2.9-ounce weight.

The accompanying photo represents a "concept design,"

so any actual products that result may look a bit different. Either way, looks like Microsoft has set its Pocket PC sights on the low-end consumer market. Watch out, Palm Zire.



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# new!

## Pocket PC News

Forget that “free” copy of Outlook 2002 as one of the bonuses of buying a Pocket PC. As of late November, Microsoft changed the bundle to include **Outlook 2000** instead, and most Pocket PC vendors are now shipping the “moldy oldie” version with new units. Of course, if you have Outlook 2002 already installed on your system, you can just ignore the bundled copy and use that instead.

IA Style ([www.iastyle.com](http://www.iastyle.com)) has released a new version of its **IA Presenter** Powerpoint tool. New to this version (\$19.95, or a free upgrade from earlier releases) are superior text and 3D object rendering, interface improvements, and—most significant—the ability to play transitions, animations, and sound effects from the original desktop PowerPoint file.

Ready to put Bluetooth to the test? HP has introduced **HP Mobile Printing for Pocket PC**, a free Pocket PC 2002 application that lets you print email, appointments, contacts, Pocket Word documents, and images to Bluetooth, infrared, and network printers. Visit [www.hp.com/sbsol/wireless/lpg/pocketpc.html](http://www.hp.com/sbsol/wireless/lpg/pocketpc.html) to download the program.

**AccuWeather.com's** new mobile service offers graphical weather data for 160 major cities in the United States. PocketPC and Palm OS device users can download the free app at [www.accuweather.com/sharpbini/index.asp](http://www.accuweather.com/sharpbini/index.asp)

## Pocket PC: The Ultimate Game Machine?

Isn't it time to pass legislation outlawing any new Breakout, Solitaire, or sliding block puzzle games? And can we please give those poor colored blocks and gems a rest and stop destroying them?

It looks like the gaming landscape is about to change for the better, if recent Pocket PC releases are any indication. Age of Empires for the Pocket PC

(reviewed in this issue) shows just what the platform is capable of—it's a 100% authentic port of the original CD-ROM game, sans multiplayer. But that's just the start. Look for some truly sophisticated games to hit the market soon.

Sony's EverQuest for the Pocket PC, which just shipped at press time, isn't an online game like its Windows counterpart. (Which is probably good; EverQuest is already nicknamed “EverCrack” because of its addictive qualities, and the ability to play anywhere, anytime could ruin peoples' lives.) Instead, it's a full-fledged, top-quality role-playing game based on the same universe as the PC game. Create characters,

explore the surrounding lands, and talk to the natives. Because it's a single-player game, it has more of a story and less of a “medieval chatroom” feel than its online counterpart. For more information, visit [eqpocket.station.sony.com](http://eqpocket.station.sony.com).

If you're just dying to defeat real players, Infinite Ventures is developing Lands of Shadowgate for both the Pocket PC and Palm OS 5. Set in the same universe as Infinite Ventures' Shadowgate Classic, this multiplayer, turn-based strategy game has you gather resources, recruit armies, and build your kingdom. Then, send your wizards, tropes, and assassins to the lands of your enemies and attempt to rule the world. The program will use an innovative “Play-by-Sync” scheme to allow players to compete by sending their turns during an ActiveSync/HotSync sessions, in addition to using smartphones and wireless PDAs. See [www.portable-games.com](http://www.portable-games.com) for the latest news.

Developers are not only innovating in the gameplay arena, they're also pushing the technology edge. At a the recent Mobile Entertainment and Gaming Expo, PocketMatrix showed an early version of a top-down, third person shooter called Varium. With colorful, fast, three-dimensional graphics, it made the iPAQ it was running on look as if it was equipped with a 3D card. This is one to watch for when it's released later in 2003. Visit

[www.pocketmatrix.com](http://www.pocketmatrix.com) for the full scoop.

So, it looks like the days of getting excited because someone had created a Pocket PC version of the old “Simon” memorization game you had as a kid are over. And there was much rejoicing.

The Pocket PC version of EverQuest isn't multiplayer, but it is a full-fledged role-playing game.



Lands of Shadowgate will support “Play-by-Sync” multiplayer.





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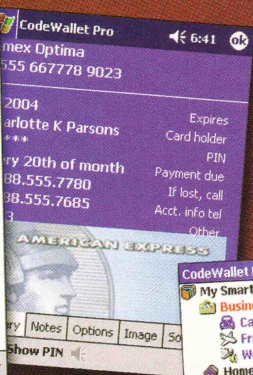
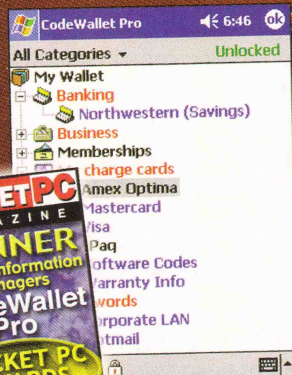
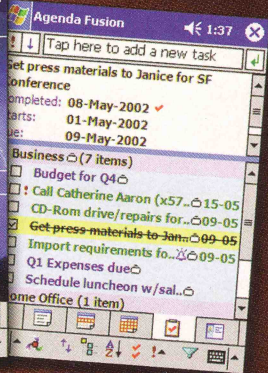
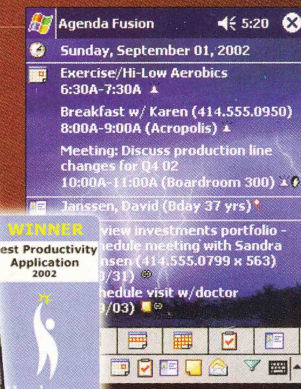
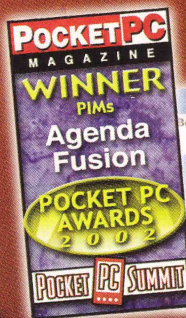
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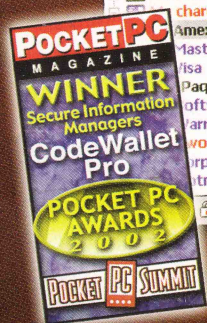


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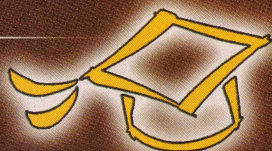
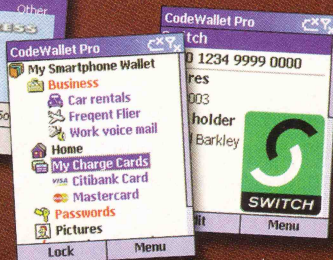


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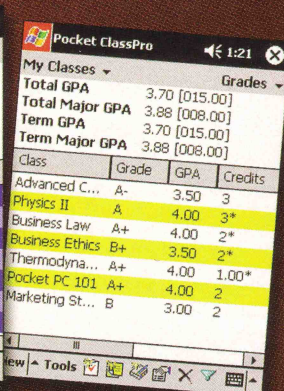
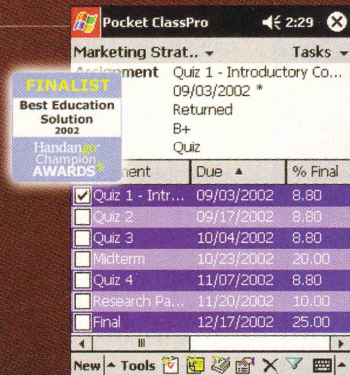


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## MP3 News

**Liquid Audio** ([www.liquidaudio.com](http://www.liquidaudio.com)) has put all of its assets up for sale. The problem with proprietary music schemes like Liquid Audio is that, while they do protect artist rights, their music can't easily be played on most existing portable audio players or burned to mix CDs. If the RIAA members would just offer guaranteed high-quality MP3s for \$1 a song, we'd gather that many folks who steal music now would happily pay the price. Proprietary formats like Liquid Audio aren't the solution.

Remember **Napster**? The late file-trading company's assets were purchased by Roxio in late November. This includes the name, as well as the file-swapping technology. No news yet on how Roxio plans to use the assets they paid \$5 million for. Obviously a company that makes CD-burning software would feel a certain affection for file-swapping services...

If you're debating whether to buy that next CD and rip the MP3s yourself or just grab the songs for free, watch to see what happens with the **Danish Anti-Piracy Group's** action against 150 alleged music pirates in Denmark. The company sent the users invoices for the songs they'd downloaded, totalling 1m Danish Crowns. Remember, actions on most file-swapping services are not private.

# new!

## Fair Pay for Fair Play

Napster may be long dead, but it left a legacy of file-swapping services just as anathema to record companies. Now, Universal Music Group—one of the “big five” music labels—hopes to entice downloaders to pay for what they've been getting for free. The carrots: low prices, a large library, and no pesky restrictions on how you use the music.

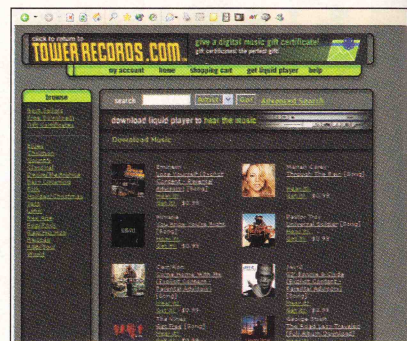
UMG's new a-la-carte system allows users to preview, buy, and download songs and albums from its 43,000-track library. Instead of subscribing to a service, you pay just 99 cents per song or \$9.99 for an entire album. What's more, you can copy your music to portable players and burn it to CDs for no additional charge. Just one relatively minor wrinkle: the songs are available only in Liquid Audio and Windows Media Audio formats—not MP3.

In another unique move, Universal doesn't force you to shop at any single store or site. The library is available at over two dozen retail and music Web sites, including

Tower Records, MP3.com, Rolling Stone, and Best Buy. That

represents a big change from music services like Pressplay and MusicNet, both of which charge by the month and impose restrictions (or added fees) on downloads, transfers to portable players, and/or CD burning. (All this may soon change, however, as those services recently hooked up with all five major record labels, including Universal.)

Why pay even a buck for a song you can get online for zip? The benefits can be summed up thusly: consistent and accurate ID3 tags (which identify the song title, artist, album, and so on); flawless tracks (unlike some of the rotten rips you find online); and a clear conscience.



Tower Records is just one site that offers Universal's music library, which represents a huge step in the right direction.

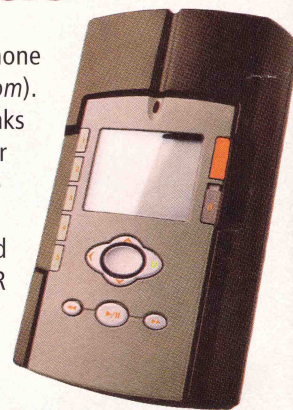
## An MP3 Player for Radio Lovers

Lots of young MP3 studs are gunning for Apple's iPod these days, but none looks as promising as Digital Innovations' **Neuros** ([www.neurosaudio.com](http://www.neurosaudio.com)). For one thing, it's available as either a 128MB Flash player (\$249) or, thanks to its detachable backpack-style sled, a 20GB hard drive player/recorder (\$399). It also does things with FM radio that, quite frankly, excite us more than Halle Berry in a bikini.

First, it can play FM radio, which in itself isn't unique. It can also record radio in the MP3 format—handy if you want to store, say, your favorite NPR show for later listening. But that's just for openers. Suppose you hear a song you like but can't identify. Press a button and the Neuros will record a 30-second “digital fingerprint.” The next time you sync with your PC, the Neuros will venture online to uncover the song and artist. Finally, the player sports a built-in FM transmitter that lets you listen to your MP3s on any stereo.

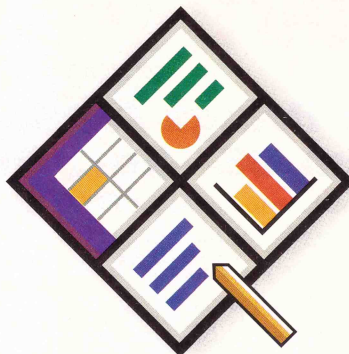
The Neuros also promises in-device playlist management, automatic PC synchronization, voice and line-in recording, and, possibly, higher-capacity backpacks in the future. The hard drive version measures 5.3x3.1x1.3 inches—roughly the same size as an iPAQ Pocket PC—and weighs 9.4 ounces.

The only major flaw we can see is the USB 1.1 interface. A 20GB hard drive all but demands a USB 2.0 or FireWire connection. What engineer do we have to knock upside the head over that blunder? Even so, we're seriously intrigued by the Neuros's capabilities, and should have a full review wrapped up in time for our next issue.



No ordinary 20GB MP3 player, the Neuros also plays, records, and transmits FM radio.





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## Digital Camera News

Six leading digital imaging companies—Canon, HP, Sony, Epson, Fujifilm, and Olympus—announced in early December the new **Direct Print Standard**. This new standard will let you connect cameras from one company directly to printers from another and print with no PC involved.

Always running out of “virtual film?” Check out Pretec’s ([www.pretec.com](http://www.pretec.com)) new Type II CompactFlash cards, available in sides from 1.5GB to a massive 3GB. Note that the 3GB card requires a camera or PDA that supports FAT32 format, limiting its use to high-end cameras such as the Canon PowerShot G2/G3. MicroDrive who?

# new!

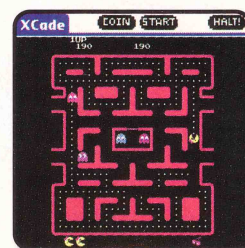
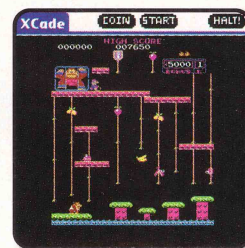
## XCade Brings Arcade Classics to Palm OS—Sort Of

These days, you have to hit the local Pizza Hut if you want to play an arcade classic like Ms. Pac Man. (What is it with Pizza Hut and Ms. Pac Man machines?) Or, you could fire up XCade ([www.codejedi.com](http://www.codejedi.com)), an arcade emulator designed exclusively for Palm OS 5 handhelds like the Tungsten T and Sony Clié NX. Can you say *wocka-wocka-wocka*?

At press time, XCade was still a beta product, but the developers continue to add support for more and more games. Before you get too excited, keep in mind that the emulator doesn’t actually come with any games. To actually play, say, Ms. Pac Man on your PDA, you’d need the original arcade-version ROM file. And where can you find said file? Ah, therein lies the wrinkle. Option one: You can buy an original Ms. Pac Man game (or just the motherboard from inside—try eBay), extract the ROM chip, plug it into your handy-dandy EPROM reader (you do have one, right?), and copy the game file to your PC. Option two (which we call the “Reality Option”): you can download the ROM file from the Web.

As you might expect, the latter option is illegal. You’re not supposed to have the ROM unless you own the game. (Certainly there’s some gray area here. What if you own the Game Boy version—does that count?) What’s more, game ROMs are increasingly difficult to come by online, despite the longtime existence of arcade emulators for the PC.

We’re hoping XCade will inspire game-makers like Atari and Nintendo to offer officially licensed, for-purchase versions of their arcade classics. The emulator’s written, guys—now sell us the ROMs!



Arcade classics never die—they just get distributed illegally.

## Specialty Handhelds Fill Niches in Education, Organization

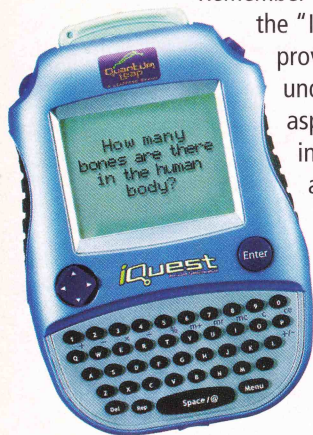
Remember 3Com’s Audrey, one of many casualties of the “Internet appliance” era? While the product proved that consumers don’t want a pricey, under-powered Web browser, at least one aspect of the idea was sound: give everyone in the family an electronic gathering point, a place to store schedules, phone numbers, notes, and shopping lists.

Simpliciti ([www.simpliciti.com](http://www.simpliciti.com)) has taken that idea and, well, simplified it. The aptly named Home Organizer Plus is a wall-mountable, PDA-style device designed specifically to help families stay organized. Up to five different users can maintain their own memos, to-do lists, address books, and so on. It comes with 500 recipes (you can add your own to the database), a scheduler with an

alarm, a QWERTY keyboard for entering data, and a voice-memo recorder. You can also synchronize the device with Outlook, dial phone numbers from the address book, add recipe ingredients directly to your shopping list, and, perhaps best of all, connect an optional printer to make hard copies of those shopping lists (and anything else). The Home Organizer Plus costs \$99; the printer is available separately.

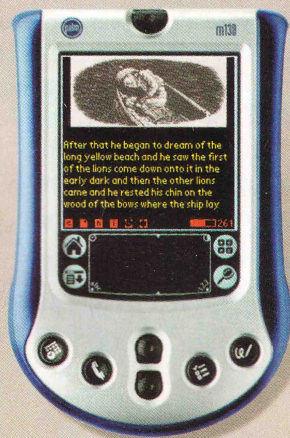
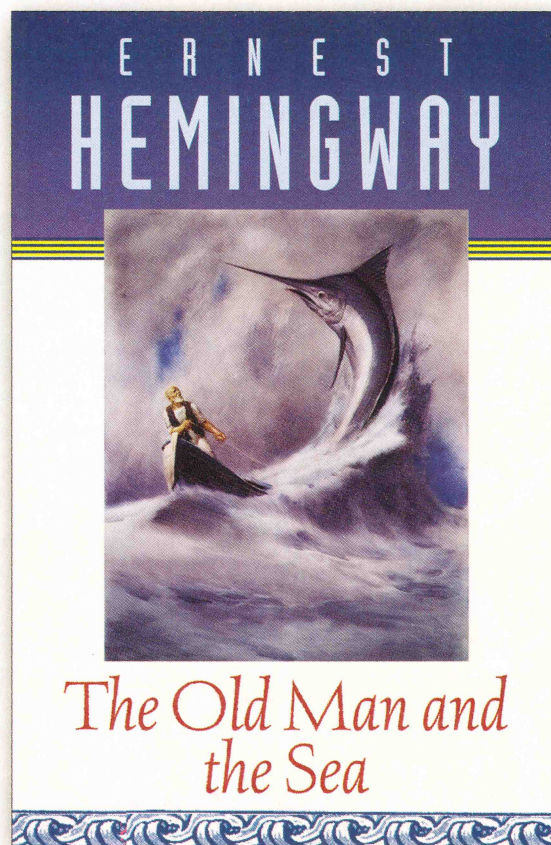
Another specialty PDA, LeapFrog’s iQuest ([www.leapfrog.com](http://www.leapfrog.com)) aims to help students get a leg up by preparing them for tests and quizzes—with questions based on their actual school textbooks. The interactive, talking, cartridge-based device is designed for students in grades 5 through 8, but new modules are available to help high-school kids prepare for the ACT and SAT/PSAT tests. The base unit comes with a 1,000-question, grade 5-8 quiz cartridge and offers two game modes: Pop Quiz and Chapter Challenge. Cartridges are available for math, science, and social studies, but you can also download quiz packs from the LeapFrog Web site. (The latter requires a special connector and a membership in the company’s Never-Ending Learning club.)

The iQuest includes a Merriam-Webster dictionary and PDA functions like an address book, scheduler, and notepad. It sells for \$60; grade-school cartridges cost \$15 each, while the ACT and SAT cartridges cost \$30.



LeapFrog’s quiz-popping iQuest is gaining popularity among grade-school and college-bound students.



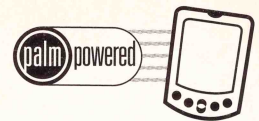


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## Putting OS 5 to the Test

You've got a shiny new OS 5 handheld—now let's justify the purchase

By Denny Atkin

Dragonball who? Just a month after the release of the hot new Palm Tungsten T and Sony Clié NX70V, a quick search of PalmGear.com shows over 365 applications enhanced for these Palm OS 5 handhelds. These aren't just programs certified to run on the new operating system; these are programs that take advantage of the handhelds' new features. Although it's still a newborn, Palm OS 5 is already showing its chops.

One of the most dramatic examples of the ARM processor's power comes from **XCade** ([www.codejedi.com](http://www.codejedi.com)), an arcade emulator. This program runs classic coin-op games such as PacMan, Donkey Kong,

and Galaxian in hi-res, and at full speed. These aren't rewritten tributes to the original—XCade uses the actual program code from the original arcade machines. And therein lies the complication: If you don't have an original Space Invaders unit in your basement, or at least the circuit board from

Image viewers are a great way to show off the speed of the ARM CPU. Pop your digital camera's memory card into a Palm OS 4.1-or-older handheld and expect to wait 10 seconds or more for an image viewer to convert and resize the picture. Using Palm OS 5-enhanced programs such as **SplashPhoto** ([www.splashdata.com](http://www.splashdata.com)) and **PicturePlus** ([www.smartcell.com](http://www.smartcell.com)), even three-megapixel images display in just a few seconds.

An even bigger payoff comes with video playback. **Kinoma** ([www.kinoma.com](http://www.kinoma.com)) was already an impressive product, but the new ARM-optimized version produces stellar frame rates during playback—and now you get good sound on Palm-brand handhelds to boot. **TealMovie** ([www.tealpoint.com](http://www.tealpoint.com)) shows similar speed improvements, and offers excellent audio on the Tungsten T, although it's currently silent on the NX-70V due to Sony's decision not use the standard Palm OS 5 audio libraries.

**iSilo** ([www.isilo.com](http://www.isilo.com)) has long been one of our favorite document readers, with support for formatted text, graphics, and expansion-card document storage. Paired with the free **iSiloX** utility, it's also a good alternative to AvantGo (currently incompatible with OS 5) for reading Web sites offline. You'll find an iSiloX file with links to almost 600 handheld-optimized sites at [www.turcic.com](http://www.turcic.com). The latest version of this \$17.50 reader is fully enhanced for Palm OS 5, with hi-res display support, the ability to double image sizes on hi-res screens, and support for the Tungsten T's navigator control. You can even redefine the T's voice memo button to activate an iSilo function.

Speaking of document readers, **Palm Reader Pro** ([www.palmdigitalmedia.com](http://www.palmdigitalmedia.com))



On OS 5, SplashPhoto displays JPEGs with blazing speed.

has not only been enhanced to support OS 5 hi-res screens, but also uses sub-pixel rendering to smooth out fonts and lets you use the select button on the Tungsten T's navigator pad to make bookmarks. You can't ask for a better display for reading e-books.

HackMaster is a very popular product that won't work on OS 5. **TealMaster** ([www.tealpoint.com](http://www.tealpoint.com)), amazingly, does let you run "selected hacks" under the new OS, but we'd suggest just seeking out new OS 5-specific versions of these popular utilities. Many of the most popular hacks, such as **Keyboard Hack II** ([www.palmgadget.com](http://www.palmgadget.com)), **ScreenShot** ([www.linkesoft.com](http://www.linkesoft.com)), and **McPhling** ([www.mikemccollister.com/palm](http://www.mikemccollister.com/palm)) are now available for OS 5.

There are hundreds of other programs enhanced for the new OS 5 devices, from the pioneering database **JFile** ([www.land-j.com](http://www.land-j.com)) to the classic **Bejeweled** ([www.astraware.com](http://www.astraware.com)) to the **Mapopolis** ([www.mapopolis.com](http://www.mapopolis.com)) navigation software. PalmGear.com has upgraded its search engine to make OS 5 apps easy to find. For a complete list, just select Advanced Software Search, then click either "Palm OS 5 Compatible" or "Palm OS 5 Enhanced," without specifying any other search terms.

*The first operating system Denny Atkin used was Commodore BASIC on a PET. He's still waiting on the upgrade.*

### Critical Hit

#### LauncherX

([www.launcherx.com](http://www.launcherx.com)) updates the classic LauncherIII with powerful new functions, a beautiful and customizable interface, and full support for OS 5, Clié, and Handera special features.

one, there's no legal way to get the ROMs to run on XCade. The program can use ROMs from the desktop M.A.M.E. emulator, but those have been almost eradicated from the Web due to copyright restrictions. ROM problems aside, though, this is a truly impressive endeavor.





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# The Great Compatibility Debacle

Pocket PCs are still stumbling. Can developers get their act together before it's too late?

by Dave Johnson

How long will it take the computer industry to learn its lesson?

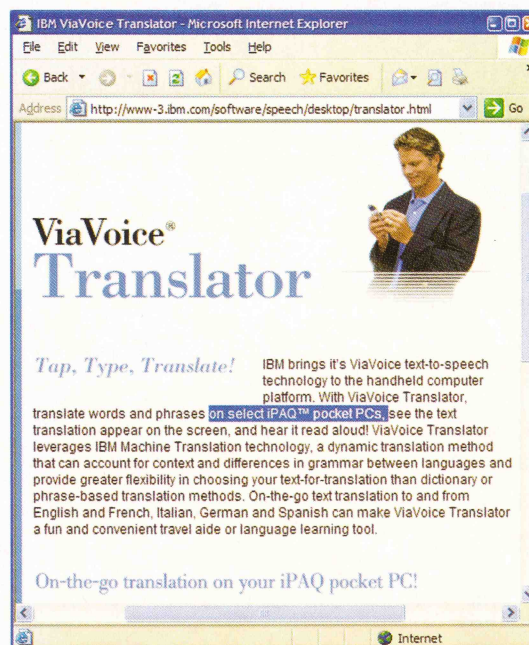
Take connectivity standards. In the old days, we had the infamous serial port, which worked about as well as your average dingo-powered airplane. It was eventually replaced by USB—a much better standard, but one still hobbled by an almost-perfectly-symmetric shape that's impossible to insert properly until the third or fourth try.

What does all this have to do with Pocket PCs? Easy: like that guy from *Memento*, we're living peripheral insanity all over again, this time in the palms of our hands. You may not have noticed

this phenomenon, but here in the *Handheld Computing* labs we live with bizarre, inexplicable incompatibility every single day. Put simply: they're all Pocket PCs, so why can't they all run the same software and peripherals?

Back in the early days of the Pocket PC, we could understand that certain apps might not run

on all devices due to incompatible processors. But those days are long gone. And we're not talking about peripherals like keyboards designed for the nonstandard sync ports at the



Like many Pocket PC products, IBM's ViaVoice Translator is compatible with a perplexingly small number of models.

bottom of the devices, either. Many PDAs have CompactFlash slots, for instance, so it would seem a no-brainer for all CF-style peripherals to slip right into place.

So why does the UltraMote Extender, an enhanced IR transmitter for remote control applications (which we tried to review in this issue), work only with a very limited number of Pocket PCs? Or take the brand-new Veo Photo Traveler digital camera. Some rocket scientist designed this puppy for such a limited number of devices that it's not physically long enough to fully engage the CF slot in many Pocket PCs! If you don't have an iPAQ, better luck with the next device that rolls along.

The broad incompatibility between Pocket PCs isn't limited to hardware, either. We have run across a number of apps that work only on certain devices.

IBM's ViaVoice Translator, for instance, is certified to run just on certain iPAQs. We recently tried an outstanding game, Douglas Beck's *RocketElite*, and found that the Quit command is hard-wired to the voice recorder button on the iPAQ. Until the game is updated, the only way to exit on, say, a Dell Axim, is to perform a soft reset.

All this is critical because it reflects poorly on the end-user experience. In the Palm OS world, the vast majority of software works just fine on any device, and those that do break tend to fail for logical reasons—like color software on a grayscale device, or telephony software on a model that's not a smartphone. SDIO is the emerging expansion standard

in the Palm world, and SDIO hardware tends to work on any SDIO-equipped device. That's the lesson Pocket PC developers need to heed if the Pocket PC is to withstand comparisons to the Palm OS—especially now that OS 5 devices make Palm look an awful lot like Pocket PC on the multimedia front. What can you do? Write to developers you like and tell them it's time to act like a community. It's time to standardize, eliminate oddball incompatibilities, and unite under the common banner of SDIO, CompactFlash, and Pocket PC 2002 software. To paraphrase the movie *Network*, we're mad as hell and we're not going to take it anymore.

*Dave Johnson's office is littered with PDA by-products that are about as compatible as Tom and Jerry.*

## Critical Hit

Install enough software on your Pocket PC and you'll see available memory plummet thanks to Windows trash. **Space Reclaimer** (\$4.99, from [valkssoft.com](http://valkssoft.com)) deletes old, obsolete, and unneeded files from your PDA to keep it in top shape.



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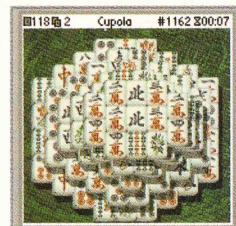
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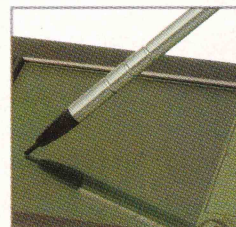
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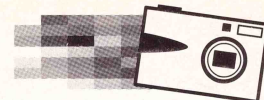


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## How Many Megapixels?

### Easy answers to the big question facing digital camera buyers

By Rick Broida

Do not adjust your set. This is not some colossal editorial mix-up. I'm temporarily filling in for Picture Perfect columnist Dave Johnson, who's on another page grouching about Pocket PCs. Meanwhile, Denny Atkin has commandeered the Practical Palm column, leaving me to expound on digital cameras—a crucial subject for a new parent like myself. I must have

#### Critical Hit

Why buy the \$80 Canon i320 ([www.canon.com](http://www.canon.com)) over another entry-level inkjet? Simple: this one can print borderless 4x6-inch photos.

snapped 100 photos of the little tyke in the first week alone, but only a handful qualified as keepers. Was it the camera, I wondered, or the photographer?

Naturally I blamed the camera. After all, here I was taking mere 2-megapixel

pictures of my only son. Didn't the little guy deserve at least 4 megapixels, if not more? More megapixels means better pictures, right?

Not exactly. A megapixel is equal to one million pixels. Thus, 2 megapixels equals two million pixels, and so on. What we're really talking about here is resolution: more pixels means higher resolution, which in turn means sharper photos. Ah, but sharper in what way? Usually the crucial issue in any megapixel discussion is the size of the print you want to make. A higher megapixel count allows you to produce larger film-quality prints. To illustrate this, here's the megapixel-to-print-size

formula (which I cribbed from my favorite book on digital photography, *How to Do Everything with Your Digital Camera, 2nd Edition*. The author's kind of a boob, but the book is outstanding.):

- 1 megapixel:** 3x5-inch prints
- 2 megapixels:** 5x7-inch prints
- 3 megapixels:** 8x10-inch prints
- 6 megapixels:** 13x19-inch prints

Okay, so obviously my 2-megapixel camera wasn't to blame for the fuzzy shots of Mini-Me. More likely, I was holding it too close to his cute little mug, or I wasn't holding it steady. Still, the camera was two years old—a dinosaur among digicams—and models with more features were calling my name.

I eventually narrowed the field to two bleeding-edge cameras (both of them reviewed in this issue): the 2-megapixel Casio Exilim EX-S2 and the 3-megapixel Canon PowerShot S230. The very first shot I took with the Exilim turned out to be the best-looking photo of my daughter ever (it's right over there—see?), so I was immediately sold. The incredible go-anywhere credit-card size didn't hurt, either. But the PowerShot seemed like a smarter buy, as it had more megapixels, more features, and better optics.

Many consumers face a similar dilemma. Do you opt for the (pardon the pun) flash, convenience, and affordability of a decent-quality model like the Exilim, or choose a bulkier,

pricier, much more capable camera like the PowerShot? Someday we'll have our cake and photograph it, too: an Exilim-size model with PowerShot-caliber features. For now—well, I honestly can't make up my mind.

No discussion of megapixels would be complete, however, without mentioning storage. Remember, more megapixels equals larger photographs equals more storage space consumed for each picture. The same memory card that holds 60 2-megapixel images might fit only 40 3-megapixel shots. Keep that in mind as you price cameras, as you'll need at least one high-capacity memory card to go with it—and that could add another \$50-100 to your overall investment.

Gotta go—the kid's doing something cute again.

*Rick Broida doesn't look any better in front of the lens than he does behind it. But they still let him be editor of Handheld Computing.*



Not bad for a 2-megapixel camera and a goofy-looking father, huh?



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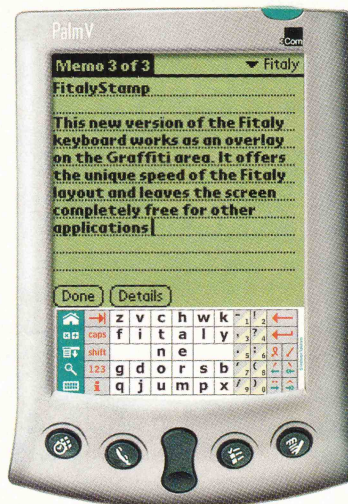
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## Buy an iPod!

It's a whole new ballgame for Apple's cult-favorite MP3 player

By Rick Broida

A funny thing happened on the way to Apple's latest market decline: it created a product people actually bought. The iPod, a compact and capacious MP3

### Critical Hit

#### MoodLogic

([www.moodlogic.com](http://www.moodlogic.com))

could be the best \$40 you spend on your MP3 collection.

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player, became an instant hit with critics and consumers, and so lead quickly to higher-capacity models (10GB and 20GB) and—surprisingly for Apple—a price reduction for the 5GB original (now \$299).

The story doesn't end there. Part of the iPod's notoriety stemmed from its initial

incompatibility with Windows. "You want an iPod? You'll have to buy a Mac, too," Apple seemed to be saying. A few opportunistic developers stepped in with bridge utilities (most notably EphPod and XPlay—see reviews in this issue), but eventually Apple saw the wisdom in producing Windows-ready iPods.

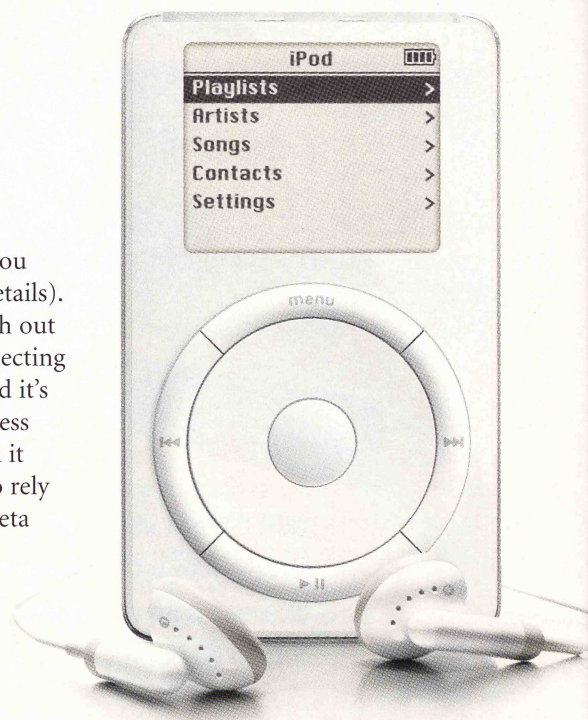
In the interim came a firmware update (1.2) that not only fixed a few quirky aspects of the iPod's interface, but also added some interesting capabilities. For starters, you can now copy your contacts and calendar (complete with alarms) to the device, effectively turning it into a kind of poor man's PDA. Like audiobooks? Audible.com recently announced support for the Mac iPod, with Windows support on the way

(there's already a workaround if you prefer not to wait—read on for details).

That fact alone drove me to fish out the 5GB Mac iPod that's been collecting dust since last spring. While I liked it's kitchen-appliance chic and effortless controls, I didn't like jogging with it (no case), and at the time I had to rely on a woefully incomplete XPlay beta to transfer songs to it. A friend tipped me off about EphPod ([www.ephpod.com](http://www.ephpod.com)), a free and remarkably comprehensive utility for working with an iPod under Windows, and sent along instructions ([www.the-midfield.com/ipod.aspx](http://www.the-midfield.com/ipod.aspx)) for converting the unit's drive to Windows' FAT32 format. EphPod also enables easy transfer of Audible.com content—just copy the .aa files from your Audible Downloads folder. Now I can fit a 13-hour Stephen King audiobook—in Audible.com's highest-quality format—into less than 200MB of space on the iPod. Into just 85MB I can squeeze six episodes of NPR's riveting *This American Life*. What about bookmarks? If you pause or stop an Audible.com file, the iPod creates one automatically.

One pocket-size device that lets me listen to spoken-word programs *and* all my music? Heaven. But wait, there's more. With EphPod I can download news feeds from half a dozen sites, including CNet and The Washington Post, as well as weather data for almost any city. It even lets me sneak memos into the contact list.

These kinds of grass-roots enhancements remind me of the early days of PalmPilots—and look what happened there. A quick perusal of MacUpdate.com reveals no fewer than



Third-party support is helping to turn the iPod into more than a kick-ass MP3 player.

three dozen third-party tweaks and utilities for the device. Which begs the question: Could this be the jumping-off point for a hard-drive based PDA? Mark my words, it's just a matter of time. Extend the iPod's screen, make it touch-sensitive, and presto: a 20GB PDA, suitable for everything from music to video.

In the meantime, the iPod is enjoying ever-increasing popularity, and with good reason. In addition to the aforementioned software, you can get a cigarette-lighter charger for the car ([www.griffintechology.com](http://www.griffintechology.com)), a variety of cases and other accessories ([www.everythingipod.com](http://www.everythingipod.com)) and even an engraved iPod straight from Apple. Truly, this is the little MP3 player that could.

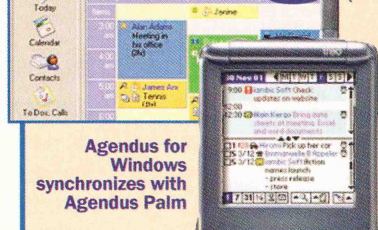
*Rick Broida has never recommended an Apple product in his life, so you can believe it when he says he really likes the iPod.*



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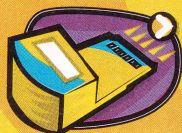
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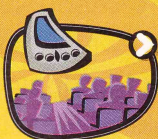
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**For Palm & Pocket PC**



# Top 40 Products of 2002

By the Editors of  
Handheld Computing

**H**ere's what we like to do at the end of every year: swear off fried foods, drink some really exceptional wine, tell the people we love that we love them (usually as a result of the wine), and pick the best handheld gear from the last 12 months. Maybe it was the hangover or the incessant cravings for a Wendy's Biggie Fries, but things got downright ugly when we settled in to choose 2002's top products. Why all the infighting? Easy: we've just witnessed the most exciting, controversial and award-worthy year in handheld history.

Consider just a few of the noteworthy products and events. Apple caused the biggest stir since the iMac with a smash-hit MP3 player that didn't do Windows. Handspring unofficially



ditched handheld PCs in favor of smartphones—with mixed results. Digital camera makers gave us 2 megapixels for \$200. Palm finally delivered a 21st-century operating system and a world-class PDA along with it. (But not before Sony stole their thunder with 10 new handhelds in as many months.) And, of course, a somewhat well known player in the PC market unveiled a \$199 Pocket PC, which is destined to shake up the PDA world like nothing before it.

Faced with this daunting task, we channeled the spirit of Casey Kasem and

whittled down hundreds of handheld products (most of them winners in their own right) into this, the Handheld Computing Top 40. Don't touch that dial until you've perused our picks.



## PDAs

### Kyocera 7135

Leave it to Kyocera Wireless to build the standout PDA/phone hybrid in a crowded market. After all, the Kyocera 7135 can trace its

heritage back to the innovative, if brick-like, Qualcomm PDQ—the first true Smartphone. That experience has paid off; this no-compromise PDA is tiny, resembling a thick Motorola Startac, yet it boasts a full Palm OS 4.1 PDA with a 16-bit color screen, 16MB of memory, MP3 player, and an SD/MMC expansion slot. The phone functions are better-integrated than in any other smartphone, with support for one-touch and voice dialing, 911 GPS location, and more. CDMA2000 high-speed wireless data offers speeds of 50-70Kbps while browsing the Web. It lacks the Treo's built-in thumbpad—a standard phone keypad is included instead—but a folding keyboard is available.

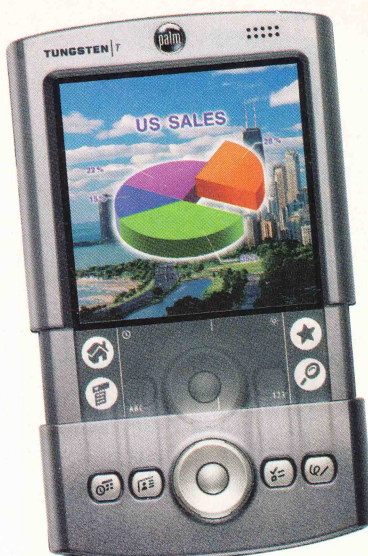
**@\$500 (price set by carrier), Kyocera Wireless, [www.kyocera-wireless.com](http://www.kyocera-wireless.com)**

### Palm Tungsten T

Does the Tungsten T represent the rebirth of the company that invented the modern PDA? Quite possibly—this PDA features a 144MHz StrongARM processor, 16MB RAM (14MB available), built-in Bluetooth, a 320x320-pixel screen, and a sliding front panel that shrinks the device to just four inches when you're not using Graffiti. There's even a navigation pad, ideal for gaming. Specs aside, the Tungsten T is a gorgeous PDA with a palpable sense of style. Intense competition from low-cost Pocket PCs will force Palm to lower prices sooner rather than later, but until



Kyocera 7135



Palm Tungsten T

then, the Tungsten T should hold its own as the best PDA Palm has ever released.

**\$499, Palm, Inc, [www.palm.com](http://www.palm.com)**

### Sony Clié PEG-NX70V

Having captured endless hearts with the revolutionary NR70V, what could Sony do for an encore? Simple: pile on more features. The NX70V boasts the same incredible screen, but adds a zippy new processor, Palm OS 5, video and audio recording and playback, a second



Sony Clié PEG-NX70V

expansion slot, and a splendid suite of Sony-built software. On the downside, 5 of its 16MB of RAM are irrevocably devoted to the bundled apps, and the new slot has limited capabilities (for now). Plus, it suddenly seems overpriced in the face of Pocket PCs that cost hundreds less. But the drool-inducing NX70V does more cool stuff than any other PDA, so we can gladly forgive its minor missteps.

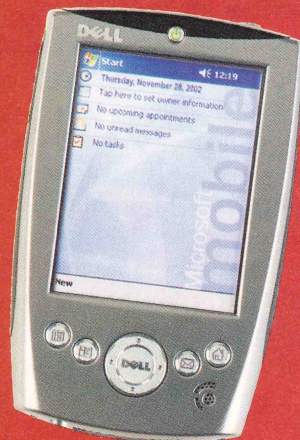
**\$599, Sony, [www.sonymstyle.com](http://www.sonymstyle.com)**

## Product of the Year: Dell Axim X5

Dell's Axim X5 isn't at the top of our list because it's a good Pocket PC—although it is—but because of the massive impact it had on the market even before its release. By bringing out fast, full-featured Pocket PCs at \$199 and \$299 (after a \$50 rebate), Dell has used its massive presence in the marketplace to halve the cost of high-end handhelds. HP, Toshiba, and others got their own low-cost PDAs ready to roll after word leaked of Dell's entry into the market. And you can expect Palm, Sony, and other manufacturers to follow suit before long. While this isn't good news for shareholders of various handheld computer makers, it's great news for consumers looking for high-end PDAs.

Despite its low price, the Axim X5 is loaded with top-quality features. Its transreflective screen rivals that of the \$599 iPAQ H3950. It boasts a removable battery, 64MB of memory, a fast XScale processor, bundled software, and a variety of available add-ons. The only real tradeoff for low cost is its bulky size—you may want to budget an extra \$30 for a pair of Dockers Mobile Pants with the extra-big pockets.

**\$199 and \$299 (after \$50 rebate), Dell, [www.dell.com](http://www.dell.com)**







T-Mobile Sidekick

## T-Mobile Sidekick

It looks like an interstellar hockey puck, and everyone seems to want one. Danger's communicator, originally known as the HipTop, is sold by T-Mobile as a mobile phone that also surfs the Web, accesses e-mail and AOL Instant Messenger, and even has a few games built in. There's no Graffiti to learn; a petite QWERTY keyboard hides under the flip-out screen. Its biggest strength for computerphobes—no messy synchronization with the desktop—is also what will keep many tech-savvy users from trying it. But in almost every other respect, this is the first smartphone that gets it all right.

**\$199 with \$50 rebate, T-Mobile, [www.tmobile.com](http://www.tmobile.com)**

## Toshiba Pocket PC e740

As the first Pocket PC to include built-in support for WiFi networking, Toshiba's e740 offers extra versatility both on the road and in the office. Not only can you ActiveSync or access the network from any location in a WiFi-enabled company, when you're on the road you can pop into just about any Starbucks (or any other location with a wireless access point) and check your email or browse the Web. Factor in a



Toshiba Pocket PC e740

400MHz XScale processor, 64MB of RAM, both CF and SD expansion slots, a removable battery, and a slim form factor, and you have one of the most versatile Pocket PCs released this year. **\$599, Toshiba, [www.toshiba.com](http://www.toshiba.com)**

## Peripherals

### Margi Presenter-to-Go

With versions of Presenter-to-Go for SD, CompactFlash, Memory Stick, PC Card and Springboard, there's isn't a PDA in town that you can't use to deliver full-resolution slideshows through any VGA video system. Desktop conversion software makes it easy to transfer documents from PowerPoint (or any Windows application, for that matter) to your Palm OS PDA. Never carry a laptop through airport security again.

**\$199, Margi Systems, [www.margi.com](http://www.margi.com)**

### Micro Innovations Wireless Link

Here's the problem with most PDA keyboards: they're incompatible from one device to the next. If you upgrade, the keyboard usually can't go with you.



Margi Presenter-to-Go

Enter the folding, ultra-compact Wireless Link (also available as the Pocketop), which relies on infrared ports—common to every modern PDA—for wireless operation and near-universal compatibility. Much as we love the concept, though, some users find the Wireless Link's keys too small for comfort—so be sure to try before you buy.

**\$99.99, Micro Innovations, [www.mic-innovations.com](http://www.mic-innovations.com)**

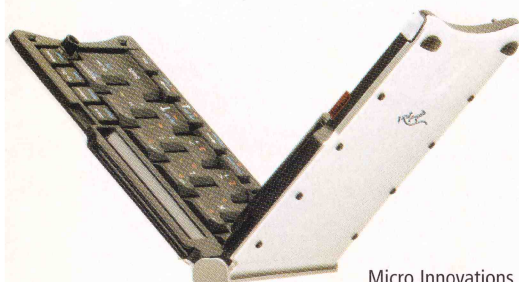
### Sony PEGA-GC10 Game Controller

This clip-on game controller for newer Clie models finally lets these handhelds—notorious for some of the worst button designs in PDA history—achieve gaming excellence. With six buttons, a four-way directional pad, and a bundled copy of Sega's Columns, this is a must-have for any gamer.

**\$39.99, Sony, [www.sony.com](http://www.sony.com)**

### Think Outside Stowaway XT

While LandWare was the first company to make us consider PDAs as viable laptop replacements with its innovative GoType!, it was Think Outside's Stowaway keyboard that created the ultimate balance between portability and typeability. Now the company's back with the Stowaway XT (reviewed in this issue), an even slimmer version that can coexist in the same pocket as your PDA.



Micro Innovations Wireless Link



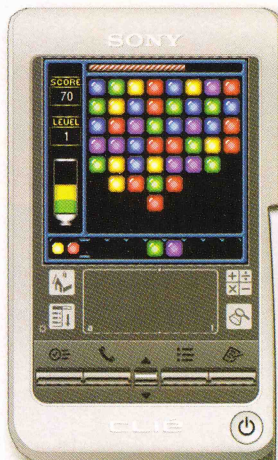
Sony PEGA-GC10 Game Controller



Think Outside Stowaway XT



## Mind-Puzzling Games for your Palm Handheld

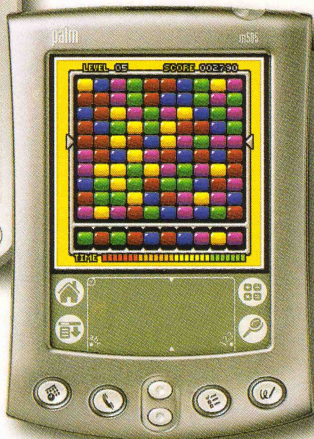


### Bubble Pop

Can you empty the bubble tank before your time runs out?

★★★★★

"Addicting Fun!" (Handango)



### Cubix

It's a race against the clock in this addictive puzzle game!

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**HANDHELD computing**  
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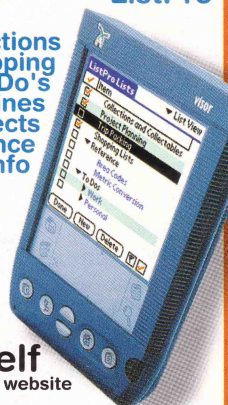
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**"The graphics are stunning; the options, seemingly endless  
Shanghai Pocket Essentials by LandWare wins the crown... by a runaway landslide win"**

— PDASquare.com



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Canon Powershot S230

We miss the number key row, but the sheer portability is amazing.  
**\$99.99, Think Outside,**  
**www.thinkoutside.com**

### Seidio Data Power Package

Seidio's Data Power Package has to be the most complete charging and synchronization solution ever devised. It's pricey, but its travel case includes all you'll need to charge your PDA using a 9-volt battery, AC wall socket, auto cigarette-lighter connector, or airliner-seat power socket—everything except solar.  
**\$59.95, Seidio, www.seidio.com**

## Digital Cameras

### Canon Powershot S230

The best digital camera in the world is useless if you don't have it with you when that perfect shot presents itself. Thus, we love the Canon PowerShot S230 (reviewed in this issue), a pocket-sized camera that doesn't sacrifice quality or features. With 3.2-megapixel resolution, top-quality optics, and the ability to shoot three-minute movies complete with sound, the S230 is a superb travel companion.

**\$399, Canon, www.powershot.com**



Nikon CoolPix 3500

### Nikon CoolPix 3500

It's smart and good-looking—just the way we like our, err, cameras. The CoolPix 3500 has a 3X zoom built into swiveling optics that makes it easy to get just the right shot, then protect the lens from scratches when you're done. The camera satisfies beginners as well as more advanced photographers with 3-megapixel stills, QuickTime movie capture, a dozen programmed exposure modes, and matrix metering. There's also a built-in flash and the ability to capture a continuous series of images.

**\$399, Nikon, www.nikonusa.com**



Sony DSC-P31

### Sony DSC-P31

There was a time when it just didn't make sense to try digital photography for under \$200—image quality was the pits. Now, Sony's DSC-P31 delivers enough pixels (2 million of them) to print 8x10 enlargements in a sweet little bullet-shaped point and shoot model. It's compact and inexpensive, yet has goodies like a 3X zoom (alas, it's digital, not optical), auto and manual focus, multiple metering modes, and a built-in flash. This is the kind of camera that would have cost \$500 just a year or two ago, making it an outstanding introduction to digital.

**\$199, Sony Electronics,**  
**www.sonystyle.com**

## MP3 Players

### Apple iPod

The iPod was already remarkable when it debuted as a 5GB Mac-only music player, but with four times the capacity and Windows support, it's pure heaven. Its FireWire interface makes for blazing-fast transfers, and you can even use it as a portable hard drive. You can pay less for players with more features, but you'll sacrifice the looks of envy that come your way when an iPod emerges from your pocket.

**\$299-\$499, Apple, www.apple.com**

### Archos Multimedia Jukebox

Like an electronic Ginsu Knife, the dazzling Multimedia Jukebox plays and records MP3 files, plays and records MPEG4 videos, stores and displays digital photos, and does it all on a mammoth 20GB hard drive. (Admittedly, you need an add-on module for video recording, which turns the Jukebox into a kind of portable TiVo.) Just one complaint: the all-but-mandatory USB 2.0 and FireWire cables cost \$50 extra.

**\$379.95, Archos, www.archos.com**

### Bantam BA50

What kind of MP3 player can you expect for a mere 80 bucks? In the case of the



Seidio Data Power Package



Apple iPod



Archos  
Multimedia  
Jukebox



Bantam BA50



The ultimate note taking bundle for Microsoft Windows powered Handheld PCs and Pocket PCs...

## CalliGrapher/HPC Notes Pack

"The combination of using my own handwriting with CalliGrapher, and storing the information in HPC Notes has proved to be an unbeatable combination."

- Elisabeth Liddell, FoxPop

Now certified with the 'Designed for Microsoft Windows for Pocket PC' logo.



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With Pocket Verifier Professional you can transfer funds from your customer's credit card directly into your checking account! Pocket Verifier Professional uses your PDA's Internet connection to authorize and transfer funds and allows you to conduct business anywhere and anytime! Look at these features:

- Instant Wireless Credit Card Acceptance
- On Screen Signature Capture **NEW!**
- Address Verification System (AVS)
- Card Reader & Receipt Printer Support
- Tip Acceptance **NEW!**
- Fully Encrypted Transactions
- Transaction Database
- Server-based Signature Storage **NEW!**
- Multiple PDA's on a single account
- Multiple Accounts on a Single PDA



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## Print from your Palm!

Using **PalmPrint** and **SnailMailer** software, print from dozens of Palm applications to a wide variety of infrared, serial, and parallel printers. "Best Printing Software of 1999" (Tap Magazine / Handheld Computing). **Platinum certified.**

## The world is your office!

Take orders or generate estimates with **Take An Order!** Take inventories with **On Hand.** View or collect data with **CatScan.** All **Handheld Office™** software is barcode-enabled using Symbol or PSC scanners.

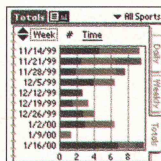
## No dupes!

Duplicate entries can be the bane of the Palm user's existence. When things go wrong with HotSync, you can end up with hundreds or thousands of duplicate addresses, datebook entries, etc. Let **UnDupe** remove them all with a single tap! **Platinum certified.**



## Record your workouts!

Use **The Athlete's Diary** to record your fitness activities, then view totals and graphs for instant feedback. Runners, cyclists, swimmers, triathletes - this is the one for you!

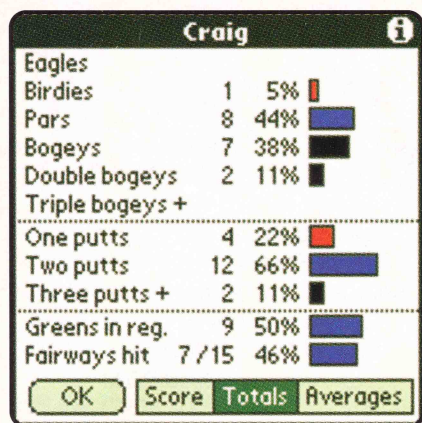


## STEVENS CREEK SOFTWARE

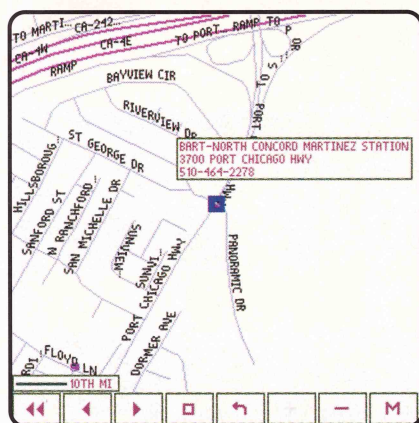
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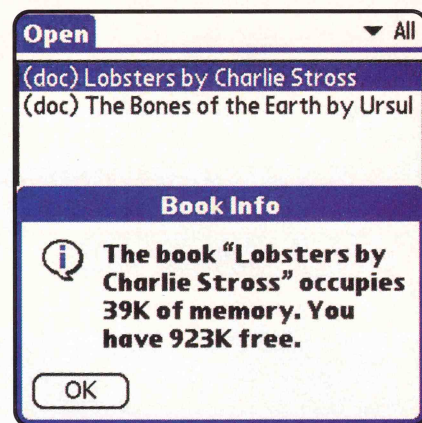




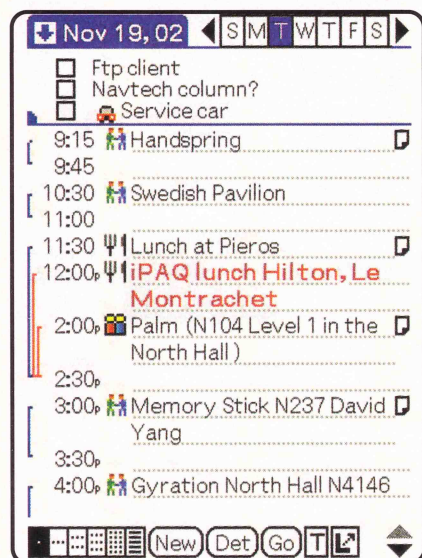
IntelliGolf



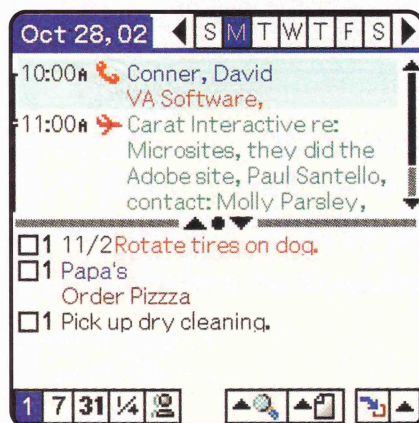
Mapopolis



Palm Reader Pro



DateBk5



Agendus

Map data is very up-to-date, and the app supports hi-res displays, as well as add-on GPS modules.  
**\$14.95/year and up, Mapopolis, [www.mapopolis.com](http://www.mapopolis.com)**

### Palm Reader Pro

Despite the name, it's available for the Palm OS, Pocket PC, and even Windows and the Mac. Long-time Palm fans like Palm Reader Pro for its ability to read standard DOC files along with commercial e-book titles downloaded from Palm Digital Media. Oodles of features—like the ability to rotate the screen, auto-scroll text, and mark up documents—make it a winner no matter what PDA you use.

**\$9.95, Palm Digital Media, [www.palmdigitalmedia.com](http://www.palmdigitalmedia.com)**

### Palm OS Software Agendus

Until recently, you knew it as Action Names. Agendus combines the Date Book and Address Book into a thoroughly integrated app with stunning use of color, smart data filtering, and the capability to review the history of activities associated with any contact. Need more? Iambic now offers an optional desktop version for even tighter synchronization.

**\$24.95, iambic, [www.iambic.com](http://www.iambic.com)**

### DateBk5

The primary power behind DateBk5 lies in its split-screen display, which lets you see simultaneously your calendar,

Bantam BA50, one that blows most others out of the water. The egg-like BA50 features not only 64MB of memory and a Secure Digital memory slot, but also an FM tuner, 20 station presets, a voice recorder, and a two-line backlit screen. Bantam's clever desktop software can convert your MP3s to space-saving WMA files on-the-fly. The BA50 is bulkier than most flash-memory music players we've seen lately, but it has more bang for the buck than any player we've seen yet.  
**\$79.99, Bantam Interactive, [www.bantamusa.com](http://www.bantamusa.com)**

### Multiplatform Software IntelliGolf

You take your golf seriously, so why would

you trust something as important as that 6-under-par weekend to a paper scorecard? IntelliGolf is a digital scorecard for Palm, Pocket PC, and Windows that lets you track scores, statistics, and sidegames, and beam the results to other players or save them as a Web page for bragging rights. Wireless users can instantly download scorecards for over 16,500 courses.  
**\$29.95 and up, Karrier Communications, [www.intelligolf.com](http://www.intelligolf.com)**

### Mapopolis

Mapopolis is a subscription-based service that costs \$14.95 to \$44.95 per year, depending on the level of detail you need in your maps. The entry-level maps include basic streets and landmarks. Platinum-level maps add address information, city boundaries, landmarks, GPS data, and the ability to create turn-by-turn route directions.



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Our cases will satisfy a large public. Fashion, elegant, modern
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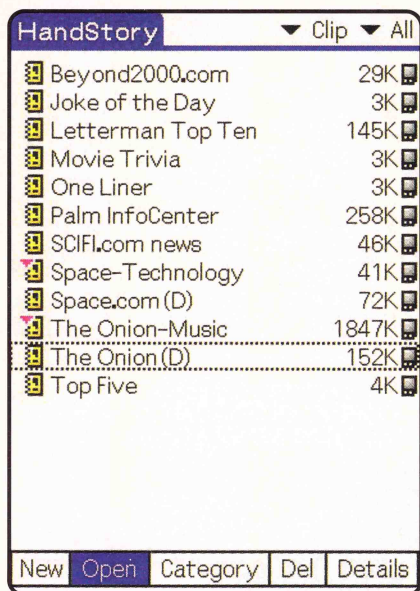
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HandStory

contacts and/or to-do items. Better still, you can establish quick-reference links between events and people. If you're a visual person, you'll like the colorful fonts, highlighting, and icons that make your events stand out. And all the profits go to a wildlife charity called Gorilla Haven.

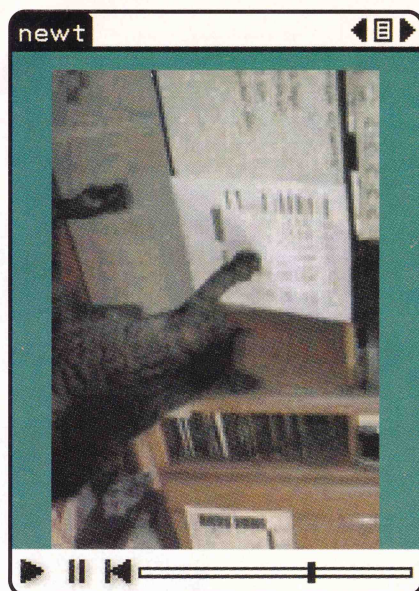
**\$24.95, Pimlico Software, Inc.,**  
[www.pimlicosoftware.com](http://www.pimlicosoftware.com)

### HandStory

Why carry four apps when one can do it all? HandStory—now available for both the Palm OS and Pocket PC—combines an e-book and text reader, image viewer, and Web-clip browser all in one handy program. The Web viewer, in particular,



LandWare Wine Enthusiast Guide



Kinoma Player & Producer

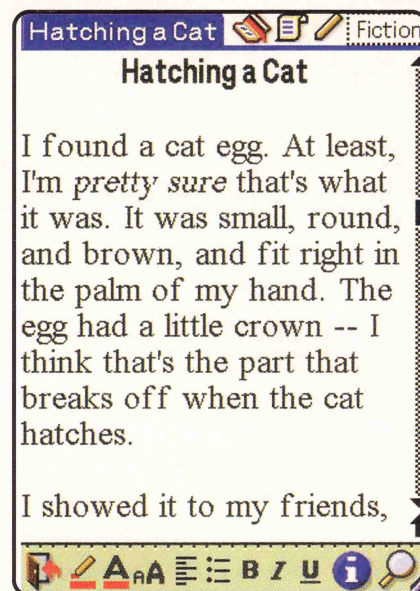
is a good alternative to AvantGo (especially for Sony Clié NR and NX users, as it supports full-screen mode).  
**\$19.95, Namo Interactive,**  
[www.handstory.com](http://www.handstory.com)

### Kinoma Player & Producer

Full-screen, full-motion video with sound: it's a dream come true for Palm OS users, who can use Kinoma to watch entire episodes of Seinfeld or the BMWfilms library anytime, anywhere. It's especially cool on an NR- or NX-series Clié, where you can turn the device sideways and watch widescreen video. The player is free, but the Producer utility—which you can use to create highly compressed, PDA-friendly versions of desktop video—costs \$29.99.  
**\$29.99 (Kinoma Producer), Kinoma, Inc.,** [www.kinoma.com](http://www.kinoma.com)

### LandWare Wine Enthusiast Guide

Don't know a vintage from a varietal? A Shyrh from a Shiraz? The Wine Enthusiast Guide arms you with reviews, ratings, definitions and prices for over 10,000 wines from across the globe. The 2003 version also serves up 21 "wine-appreciation courses" for your edification. Skoal!  
**\$29.95, LandWare,**  
[www.landware.com](http://www.landware.com)



Quickoffice Pro

### Quickoffice Pro

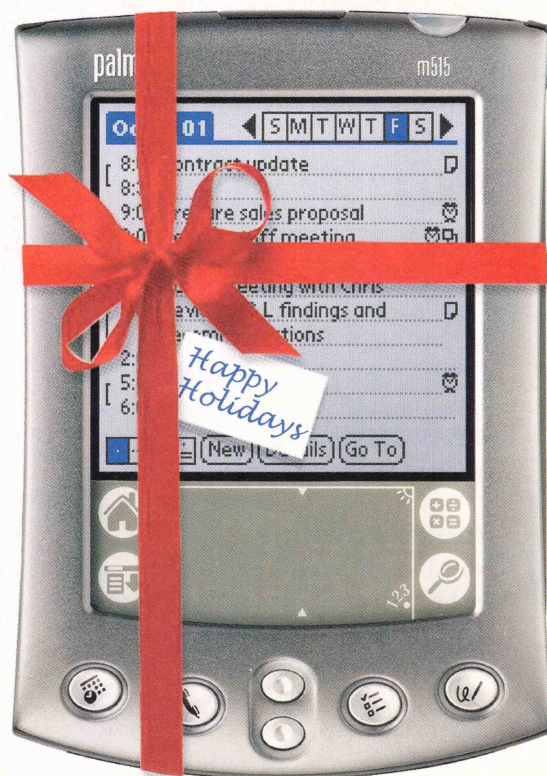
Documents to Go—which comes free with most Palm OS devices—is fine, but Quickoffice includes extras like a dictionary, thesaurus, and word count tool. Add iGo's Pitch to display PowerPoint slides on a VGA projector. And in conjunction with Corsoft Aileron, you can use Quickoffice to edit Word and Excel attachments in e-mail. It's the best all-around office suite for the Palm OS.  
**\$39.95, Cutting Edge Software,**  
[www.cesinc.com](http://www.cesinc.com)

### SilverScreen

Give your Palm Powered PDA a first-class makeover with SilverScreen, an application launcher that wins the beauty contest hands-down. Compatible with a growing number of free and commercial skins, this program lets you change the look of your handheld at will. Plus, it provides convenient category tabs, a toolbar for beaming, deleting, and organizing your apps, and a pair of programmable quick-access buttons. Other launchers do more, but none approach the beauty or simplicity of SilverScreen.  
**\$24.95, PocketSensei,**  
[www.pocketsensei.com](http://www.pocketsensei.com)



# PDA SKILLS. PDQ.



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Save \$30 by registering online. See complete details at [www.pdabuzz.com/training](http://www.pdabuzz.com/training)

**Class Schedule.**

**Jan 18 - San Francisco, Palm OS** (2 sessions: 9:00 - 12:30 & 1:30 - 5)

**Jan 25 - San Jose, Palm OS** (2 sessions: 9:00 - 12:30 & 1:30 - 5)

**Feb 1 - Los Angeles, Palm OS** (2 sessions: 9:00 - 12:30 & 1:30 - 5)

**Feb 8 - San Francisco, Palm OS** (9:00 - 12:30), **Pocket PC** (1:30 - 5:00)

**Feb 15 - San Jose, Palm OS** (9:00 - 12:30), **Pocket PC** (1:30 - 5:00)

**Feb 22 - Los Angeles, Palm OS** (9:00 - 12:30), **Pocket PC** (1:30 - 5:00)

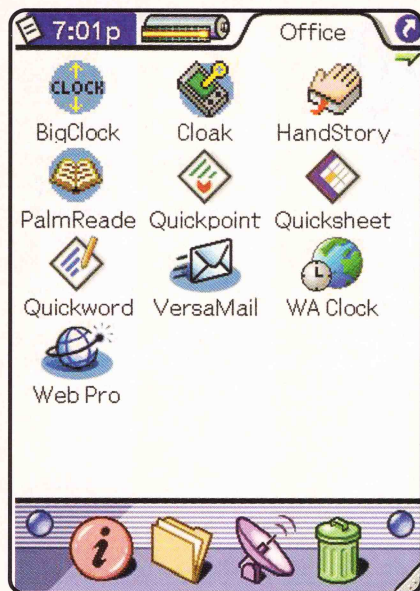
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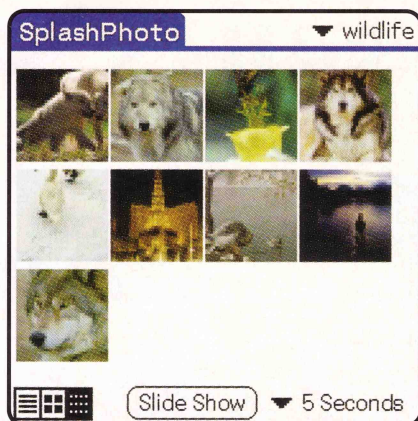




SilverScreen

## SplashPhoto

Combine a handy desktop image-converter with a fast and attractive image viewer for the Palm OS and you get SplashPhoto. Don't want to convert your images first? SplashPhoto also displays ordinary JPEG images, complete with hardware acceleration on certain models. Thumbnails, slideshows, even an auto-show when the PDA charges in its cradle—there's



SplashPhoto

no better image viewer than SplashPhoto.

**\$19.95, SplashData,**  
**[www.splashdata.com](http://www.splashdata.com)**

## Rook's Revenge

Not since the classic Battle Chess have we been so enamored with a chess game. In Rook's Revenge, forget endless decision-making between moves: the match unfolds in real time, meaning you make as many moves as you can as quickly as you can—while your computer opponent does the same. It's like chess on speed—and we're hopelessly addicted.

**\$14.95, Astraware,**  
**[www.astraware.com](http://www.astraware.com)**

## Billiards 4.0

The most technically impressive Palm OS game of the year, Billiards 4.0 shows off high-resolution screens better than any other—and plays a damn mean game of pool in the process. It's designed for one or two players and offers a variety of games (including Billiards, Pyramid, 9-ball and three varieties of 8-ball). And if you have a Sony NR or NX handheld, you get a glorious full-screen table. Rack 'em up.

**\$22.95, Megasoftware2000,**  
**[www.megasoftware2000.com](http://www.megasoftware2000.com)**

## Bump Attack Pinball

Pinball is hard to get right on a handheld PC, but Bump Attack cracks the code with clever scrolling tables (some of which appear "full screen"



Rook's Revenge

on Sony NR and NX models). Though the original two tables were fairly basic, Iambic has generously added three more since the game's release, all of them engaging and gorgeous. This is portable pinball at its finest.

**\$19.95, Iambic, [www.iambic.com](http://www.iambic.com)**

## The Missing Sync

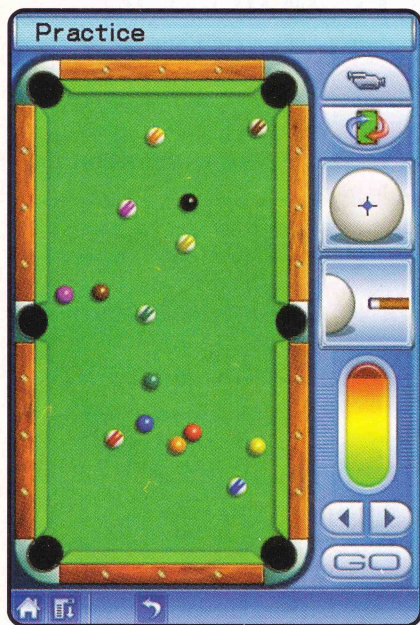
It started as a simple utility for HotSyncing the Sony Clie with the Mac. Now it turns the formerly Mac-ignorant Clie into the perfect Apple companion. Missing Sync not only syncs, installs, and backs up your Clie data, it also integrates the Clie's MP3 player with iTunes, transfers photos (including NR70V



Bump Attack Pinball

camera shots) to and from iPhoto, and lets you mount your Memory Stick on the desktop.

**\$29.95, Mark/Space,**  
**[www.markspace.com](http://www.markspace.com)**



Billiards 4.0





## "Reorganize, rename and revise contact information? Re-diculous!"

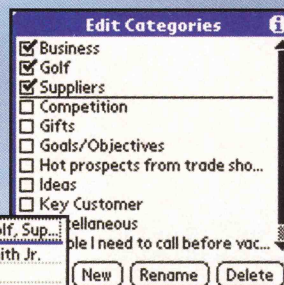
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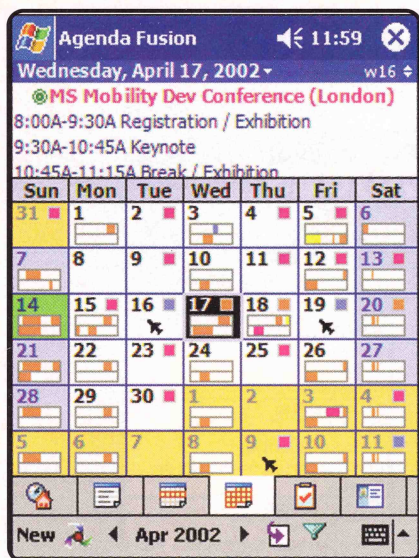
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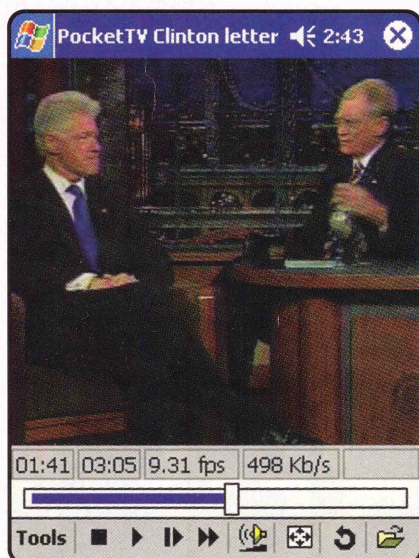
Agenda fusion



Resco Picture Viewer



Argentum



PocketTV



Ultrasoft Money

## Ultrasoft Money

The perfect companion to Microsoft Money, Ultrasoft Money Pocket Edition is a full-blown financial management package for Palm OS. You don't need your desktop computer to reconcile accounts, look for future bills and deposits, or get reports on your spending. A stand-alone version, Ultrasoft Checkbook, is also available, and the Family Edition can keep both you and your spouse in financial sync. **\$34.95, Ultrasoft, [www.ultrasoft.com](http://www.ultrasoft.com)**

## Pocket PC Software Agenda Fusion

Agenda Fusion simplifies information management on the Pocket PC by grouping the core organizer apps into a single program, making them much easier to access and navigate. Then it pumps them full of new features, such as six ways to view your data, color-coding and grouping of related items, and hyperlinking between entries. **\$19.95, Developer One, [www.developerone.com](http://www.developerone.com)**

## PocketTV

There are a number of video viewers for the Pocket PC—and some, like Snapstream's PocketPVS, are easier to use—but none can match the sheer versatility and video quality of PocketTV. Advanced features include

drive buffering to extend battery life for Microdrive users, and color dithering for better-looking images. Best of all, the basic program is free, although the \$49.95 Enterprise Edition offers optimized support for StrongARM and XScale CPUs, as well as hardware acceleration on the Toshiba e740.

**Free, MpegTV LLC, [www.mpegtv.com](http://www.mpegtv.com)**

## Resco Picture Viewer

Show your pictures with style. Resco Picture Viewer reads a wide variety of still image formats and MPEG video from your Pocket PC's memory card or internal memory. The program also includes drawing tools, a screen-capture utility, and a slideshow mode (complete with MP3s for a soundtrack), making it one of the most well-rounded image viewers ever.

**\$9.95, Resco, Ltd., [www.resco-net.com](http://www.resco-net.com)**

## Argentum

Delete the 73 copies of Solitaire on your Pocket PC. Retire the Pac Man clone. Real gaming is here. Argentum is a full-blown, real-time strategy game of planetary conquest that rivals the games you'd see on a PC just a few years ago—but with better graphics. Once you've finished the 14 built-in missions, the editor lets you create your own or download new ones. **\$19.95, Ionside, [www.ionside.com](http://www.ionside.com)**



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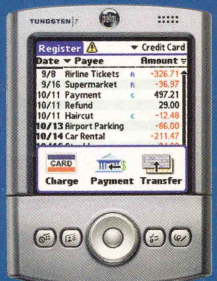
### Pocket Quicken

Instantly organize your finances - anytime, anywhere. Pocket Quicken is the standard in mobile financial tracking software that makes managing your finances as easy as turning on your handheld. Pocket Quicken places your financial activity at your fingertips making it easy to keep your Quicken information complete, accurate and up-to-date wherever you go. Effortless data entry coupled with instant access to account balances, transactions, credit limits, budgets and more add up to financial clarity in the Palm of your hand. Now compatible with Palm OS 5.0.

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Lemonade, Inc.

### Lemonade, Inc.

Cool and refreshing, Lemonade, Inc. updates the classic kid-business game with slick Sims-like graphics and enough new gameplay options to satisfy budding entrepreneurs of all ages. Will you build a lemonade-stand empire with the right mix of advertising, location and recipe, or watch it crumble under the weight of too-high prices and too much sugar?

**\$19.95, Hexacto, [www.hexacto.com](http://www.hexacto.com)**

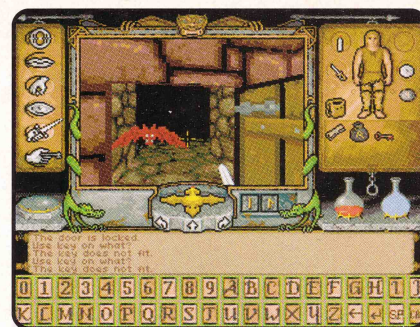


Snails

### Snails

At first it looks like your basic mollusk mayhem, another case of gory gastropod genocide. But this cartoonish snail vs. snail artillery game is chock full of fun, strategy, and laughs. And it's not just action—there's a wacky storyline behind each mission. The latest version even includes multiplayer over TCP/IP—finally, a legitimate use for WiFi cards in the office!

**\$11.95, PDAMill, [www.snailsgame.com](http://www.snailsgame.com)**



Lemonade, Inc.

### Ultima Underworld

The classic game that built the first-person role-playing genre on the PC has been faithfully ported to the Pocket PC. Ultima Underworld sends you into a 3D dungeon to fight evil, gather treasure, and build up your stats—it's a complete, accurate recreation of the PC classic.

**\$29.95, ZIOSoft, [www.ziosoft.com](http://www.ziosoft.com).** ♦

## Readers Name Their Top Products of 2002

Last November, we asked visitors to our Web site ([www.pdabuzz.com](http://www.pdabuzz.com)) to name their favorite MP3 players and Palm OS and Pocket PC handhelds. We received tons of great input; here's some of the best.

Now that I own a [Pocket PC] **Phone Edition**, I won't own a lesser Pocket PC again. This delivers exactly what I've needed throughout my entire business life. You just can't imagine what you're missing until you own one.

—SwampNut

Now that all of its initial problems have been corrected, I'm going to have to vote for the **Toshiba e740**. You just can't beat the built-in WiFi plus dual expansion slots (and the 400MHz XScale [processor] doesn't hurt either).

—PennyWisdom

My vote goes to the **iPAQ 3900** series. The screen is just incredible.

—ucfgrad93

I nominate the **Toshiba e310**, simply because it was the pioneer of the slim Pocket PC era, as well as the first Pocket PC to dramatically reduce prices.

—KyleC

The Clie family of PDAs has got to be the best. They are very diverse and meet many different needs. But I must take my hat off to my latest buy: the **Clie NX70V**. This PDA raises the bar of multimedia on the Palm platform. Not only that but it has the best-looking screen to date in the PDA world.

—mikedemo

Well, I would vote for the **Handspring Treo 300**. This is a very capable device with a winning size (very easy to carry around). It has replaced my Palm VIIx and cell phone.

—Michael Pesare

The **Tungsten T** is the best PDA I have come across. The Bluetooth is great for syncing. I even have Internet sharing set up with my PowerBook running OS X. Now, I can surf the Web or do e-mail anywhere with 30 feet of my Mac. Very slick!

—Varipapa

Since [Palm] lowered the price I would have to go with the **m515**.

—tuffguy

**iPod, iPod, iPod.** If I could vote a thousand times I would vote for the iPod. I had vowed to NEVER purchase another Apple product after they canned the Newton Messagepad back in '98, but the iPod is so well designed and executed (10GB/20GB models) that it brought me back into the fold. I bought a 10GB model after buying and returning about 3 other MP3 players, and I love it so much I bought one for my wife. Now SHE'S hooked.

—pcpocket



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Just months ago, the choice between Palm OS and Pocket PC was like the choice between General Motors and Porsche. While Palm Powered devices ranged in price and performance from Chevette to Corvette to Cadillac, Pocket PC manufacturers offered only turbocharged Porsches. Getting behind the wheel required a major cash investment, with only older Pocket PC models selling for much under \$500.

Then word hit that Dell was planning to enter the market with an inexpensive Pocket PC. Hardware manufacturers scrambled to respond, and now would-be Pocket PC owners have a wide variety of choices not just under \$400, but under \$300 as well. In fact, as this issue went to press, the least-expensive color Palm OS devices (the Palm m130 and Sony Clie SJ30) sold for \$249—that's \$50 more than Dell's \$199 entry-level Pocket PC.

Despite the low prices, most of these Pocket PCs sport features comparable to units that sold for twice the price earlier this year. All of the devices reviewed here include fast ARM processors, plenty of memory, color screens, expansion slots, and directional control pads, with the primary differences being form factor, design, and battery setup.

Of course, there's a danger here. As price wars escalate and profit margins drop, we're likely to see more companies follow Casio's exit from the handheld market. Just look at how many desktop PC manufacturers disappeared after the commoditization of the PC market by Dell and other companies. In the end, that could mean fewer choices and less innovation as companies focus less on innovation and more on cost reduction. It could also leave with you support and/or warranty problems if your vendor hits the skids or drops out of the market.

Already there's a definite "sameness" about these Pocket PCs; we'd like to see more variety. For instance, why does no

# Pocket PC Bargains

***Suddenly, "too expensive" is no longer a valid excuse not to buy a Pocket PC***

By Denny Atkin



Pocket PC manufacturers include a screen cover, a feature ubiquitous among Palm OS handhelds, but not seen on a Pocket PC since the cancellation of HP's excellent Jornada 560 series? One thin snap-on piece of plastic could make even Dell's big Axim X5 truly pocketable.

For the time being, it's the consumer who wins, with a variety of Pocket PC choices that won't break the bank. And we expect the price war to bring down the costs of other handheld platforms, such as Palm OS and Linux, as well.

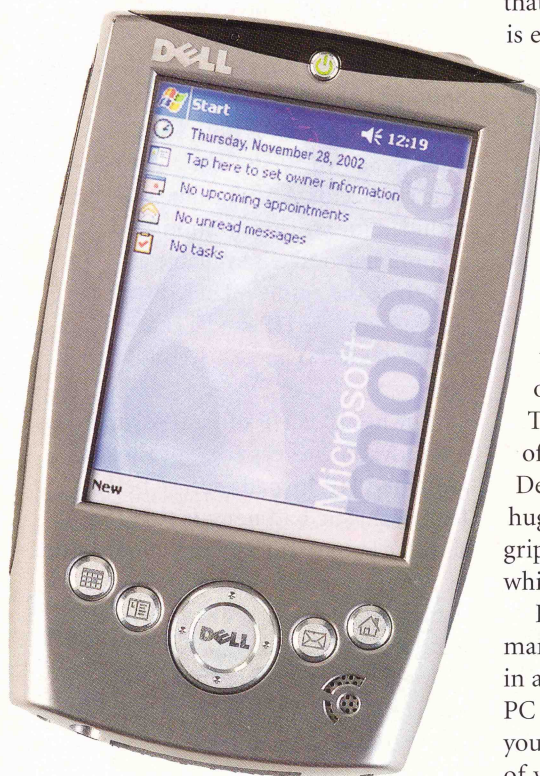
### Dell Axim X5 A Big Value, and Just Plain Big

Had the Dell Axim X5 shipped this time last year at \$599, it would still have still received rave reviews. Thus, it's no wonder that the device's release at half that price has turned the Pocket PC market on its head.

The Axim X5 is available in two models. The Advanced version costs \$299, while the Basic edition sells for a mere \$199. (Both prices are after a \$50 mail-in rebate, which Dell says will only go away if demand severely outstrips supply.) The Advanced model sports a 400MHz XScale processor, 64MB of RAM, 48MB of ROM (a massive 21MB of which can be used as safe backup storage for your own files), and a USB cradle. The Basic model differs in that it includes a 300MHz XScale processor, 32MB of RAM, 32MB of ROM, and a USB travel cable. Otherwise, the units are identical.

The Dell Axim X5's feature set sounds like a Pocket PC wish list. Its bright transreflective 3.5-inch display rivals the market-leading iPAQ's in quality. It boasts not only an SD/MMC expansion slot, but an IBM Microdrive-compatible CompactFlash slot as well. The removable, rechargeable battery offers eight hours of typical usage, and the cradle included with the Advanced model (which is, by the way, the coolest looking cradle in the history of PDAs)

boasts a slot for simultaneously charging a second battery. An optional larger-capacity battery adds a little thickness, but more than doubles battery life.



Dell's Axim X5 wins for price and performance, but it's the least pocketable of the bunch.

Physical design is a mixed bag. The buttons and five-way navigation pad work well, but the press-to-select function of the side-mounted "stick" that takes the place of the typical jog dial is extremely difficult to use. The Axim

X5's physical design looks good, and the rubberized sides make for a comfortable grip. However, it appears that one way Dell managed to cut costs was by not bothering to miniaturize anything. While the Axim X5 is slightly shorter than the larger iPAQ models, it's actually wider and thicker. At 5x3.2x0.7 inches and 6.9 oz., you'll need a mighty big pocket. The situation is worsened by the lack of any sort of snap-on screen cover—Dell's leather case for this device is huge, and it lacks a belt clip. Another gripe is the ultra-light plastic stylus, which feels flimsy.

Despite its low price, Dell still manages to bundle some useful software in addition to the usual suite of Pocket PC 2002 applications. IA Presenter lets you bring along pocket-sized versions of your PowerPoint presentations, and Resco Picture Viewer is handy for showing off your digital camera images.

One problem owners of new handhelds often face is a lack of available add-ons. At launch, Dell offered a series of memory cards and a foldable keyboard; and additional options, such as a mini-keyboard, Presenter-to-Go module, and other peripherals, should be available by the time you read this.

The Axim X5 isn't perfect—and like Dr. Evil's laser cannon, it's frickin' huge—but its no-holds-barred feature set and rock bottom price combine to easily make it a Top Pick.

### HP iPAQ h1910 When Size matters

Hewlett-Packard isn't planning to sit back and let the competition grab the low end of the market. The company's

#### Dell Axim X5

Dell

[www.dell.com](http://www.dell.com)

**\$199 and \$299 (after \$50 rebate)**

Pocket PC 2002, 400MHz XScale processor, 64MB RAM, 21.2MB flash storage, USB cradle (Value edition has 300MHz processor, 32MB RAM and USB cable)

#### Pros

- The most bang for the buck
- Removable battery
- Superb screen

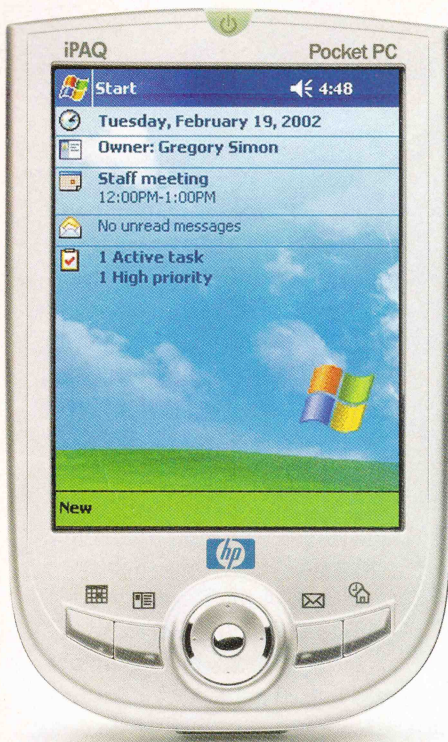
#### Cons

- You'll need a really big pocket
- Poor jog-rocker design

**A-**







The iPAQ h1910 is a fraction of the size of earlier iPAQs.

### HP iPAQ h1910

Hewlett-Packard  
www.hp.com  
\$299

Pocket PC 2002, 200MHz XScale processor, 64MB RAM (48MB usable), no flash storage, USB cable

#### Pros

- Excellent button design
- Removable battery
- Superb screen
- Very compact and light

#### Cons

- Short battery life
- No jog dial
- Slow processor

# B-



new iPAQ Pocket PC h1910 comes with a low \$299 price and one of the slickest designs we've seen yet for a Pocket PC.

Earlier iPAQ models were among the biggest handhelds available, barely fitting the "Pocket" PC description. At 4.5x2.75x0.5 inches and a mere 4.2 oz., the h1910 is slim, sleek, and extremely portable. We particularly like

the wide design of its buttons and the large, round five-way navigation pad, which are significant improvements over the tiny round buttons and odd, oval nav pad on recent iPAQs.

With its compact size, the h1910 is unable to use the expansion sleeve options available for the big iPAQ models. Expansion is limited to the built-in SD/MMC slot and the USB sync connector. A USB cable is included for synchronization, and an optional cradle is available as well. Like the cradle included with Dell's Axim, the HP cradle can simultaneously charge a second battery.

The h1910 is HP's first iPAQ to boast a removable battery (one of the late, lamented HP Jornada series' better features). The bad news is that the slimline battery offers a mere four hours of runtime, so depending on your work habits, you may want to consider an additional \$50 battery.

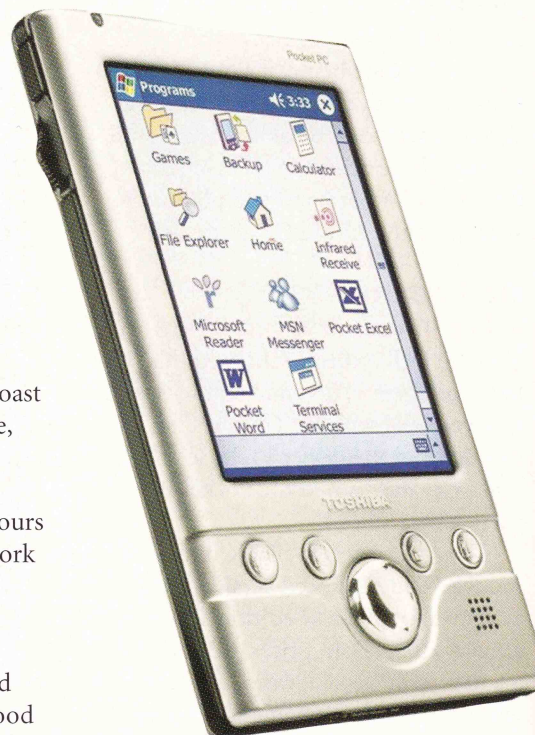
Compaq pioneered the use of transreflective screens on PDAs, and the h1910's 3.5-inch display is as good as its high-end brethren—among the sharpest and brightest we've seen. In the performance department, however, the h1910 trails the pack. Its XScale processor runs at a mere 200MHz, slower than any of the other low-end units, and while it boasts 64MB of RAM, only 48MB is actually user-accessible. The mere 16MB of ROM has us concerned about future upgradeability.

We see the h1910 appealing to the same crowd who bought the Palm V and m500 series: users who are more concerned with design, functionality, and portability than performance and expandability.

### Toshiba e330/e335 More Power, Same Thin Package

At first glance, Toshiba's Pocket PC e330 is identical to its e310 predecessor. And that's not a bad thing: The e310 was the first

"slimline" Pocket PC, and the e330 follows in its footsteps with a 4.9x3.1x0.4 in., 5.1 oz. form factor. Inside, though, the device has been updated with a faster processor and double the memory.



Toshiba's e330 is an updated version of its groundbreaking e310.

### Toshiba e330

Toshiba  
www.toshiba.com  
\$349

Pocket PC 2002, 300MHz XScale processor, 64MB RAM, no flash storage, USB cradle

#### Pros

- Thin and light
- Good software bundle
- Slick design
- USB host cable available

#### Cons

- No flash storage
- Mediocre screen
- Non-removable battery

# B-





The e330 includes a 300MHz XScale CPU and 64MB of memory, placing it in the middle of the performance pack here. It offers a slight boost over the 206MHz processor in the e310, particularly with XScale-optimized software, but certainly not enough to justify an upgrade from the earlier device.

The e330's screen is brighter than the e310's, but it's the least impressive of this group. Its brightness and contrast are reminiscent of first-generation Pocket PCs, and it's not easily viewable from an angle. The PDA's MediaQ graphics chip offers 256K of video memory and promises improved graphics performance from properly optimized applications. Audio quality through the built-in speaker was good, although we did encounter some stutters when playing MP3 music from an MMC card; files on an SD card played back with no problem.

Expansion comes from a single SD/MMC slot. You'll definitely want to add a card when on the road, as there's no user-accessible flash memory for backing up critical files. An optional USB host cable lets you attach USB peripherals that have Pocket PC drivers available; a keyboard driver is built-in. The e330's non-removable battery is good for about eight hours of typical usage.

Toshiba also offers an e335 unit in retail outlets; the only difference is the bundling of the ArcSoft Photobase picture display software (the e330 includes only the standard Pocket PC 2002 applications). The e335 sells for \$399, but a \$50 rebate brings its price down to the e330's level.

Overall, the e330 is a decent if unexceptional handheld that suddenly seems overpriced. If Toshiba drops the price in answer to Dell's entry in the market, the e330 will appeal to those looking for a thin, stylish handheld with better performance than the iPAQ h1910.



Viewsonic's ultra-lightweight V35 boasts excellent graphics and audio, but has less available memory than its competitors.

### Viewsonic V35

Viewsonic  
www.viewsonic.com  
\$299

Pocket PC 2002, 300MHz XScale processor, 64MB RAM (36.5 MB usable), 5.2MB flash storage, USB cradle

#### Pros

- Compact and lightweight
- Very good screen

#### Cons

- Only 36.5MB free
- No "select" function on directional pad
- Non-removable battery



### Viewsonic V35

#### A Case of Memory Loss

Although Dell made the big media splash, it was actually Viewsonic that broke the \$300 price barrier for Pocket PCs with its V35. And like Dell's entry, the V35 is surprisingly full-featured for the price. Unfortunately, a peculiar design decision makes nearly half of

the V35's 64MB of memory inaccessible for program and data storage.

The V35 ties the iPAQ h1910 for the lightweight crown at a mere 4.2 oz, and it measures a slim 4.8x3x0.5 inches. Despite its lightweight plastic construction, the V35's components don't feel cheap. Its sharp, 3.5-inch transreflective display is bright and viewable from all angles, and the speaker is the loudest and clearest of all the Pocket PCs tested here. The four-way navigation pad has a good feel, but there's no "push to select" feature, so you'll need to use the jog wheel to make selections when you're not using a stylus.

Speaking of the stylus, the one included with the V35 uses a collapsible design to save space. If you typically hold the bottom half of a stylus when writing you won't have any problems, but if you hold it near the top, it collapses when you tap the screen. Those looking for a laptop replacement, take note: Like Dell, ViewSonic offers a foldable keyboard for the V35.

The V35 is an average performer, with a 300MHz XScale processor and 64MB of RAM. Unfortunately, a mere 36.5MB of that 64MB is available for storage of programs and data—the remaining memory is used by the operating system. So the V35 ends up offering barely more storage than a 32MB Pocket PC. Another 5.2MB of flash memory can be used to safely store critical files so they won't be lost after a major crash or battery failure. The non-removable battery offers about 10 hours of typical usage, and a USB charging cradle is included.

Although the V35 is a bit slower than Dell's Axim X5, and it lacks that device's CompactFlash slot and removable battery, it's dramatically easier to carry. But with nearly half of its memory essentially inaccessible, you'll want to budget for a memory card if you plan to install more than a few applications on the device. ♦



# PDA Power

# Home Theater

Turn your old PDA into the equivalent of a \$999 universal remote control

By Dave Johnson

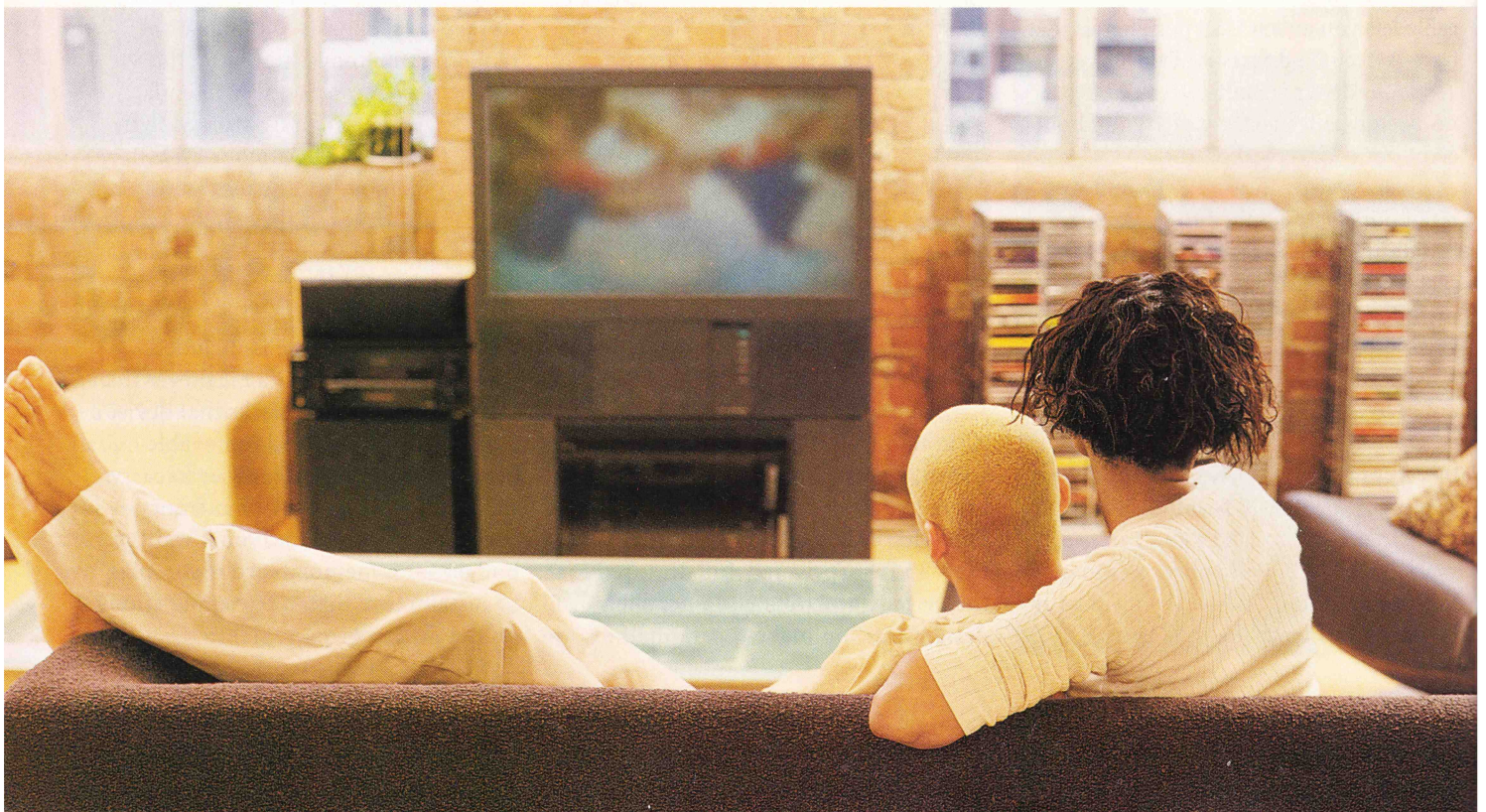
**A**s our living rooms have become cluttered with multiple home entertainment devices—TVs, stereo receivers, CD players, VCRs, DVD players—we've sought the Holy Grail of consumer electronics: a single, master remote control to replace the growing pile of remotes cluttering the coffee table. A universal remote allows you to operate every device in your home theater. Gone are the problems associated with remembering how to operate five different gadgets. No more swapping remotes just to change channels and adjust the volume. And most importantly, your significant other can finally master how to turn on the television, set it to Dolby Digital, and play a DVD without your help.

Universal remotes are expensive, though. Really good ones—not blister packed models from Wal-Mart—tend to cost hundreds or (hold on to your hat) thousands of dollars. But

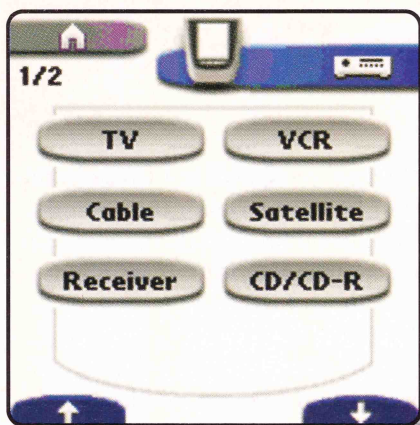
PDA's have infrared ports, and there are a surprising number of applications for both Palm and Pocket PC that let you use your favorite PDA to operate your TV, VCR, DVD player, and more. While buying a \$300 PDA to replace a remote control might be overkill, this is the perfect use for that older handheld that's been gathering dust in a drawer since you upgraded.

How well do these programs work? To find out, we trained both Palm OS and Pocket PC devices to operate a fairly complex home theater which included a Sony HDTV, Denon AV receiver and 5-disc DVD player, a pair of Sony 400-disc CD carousels, and a Philips TIVO.

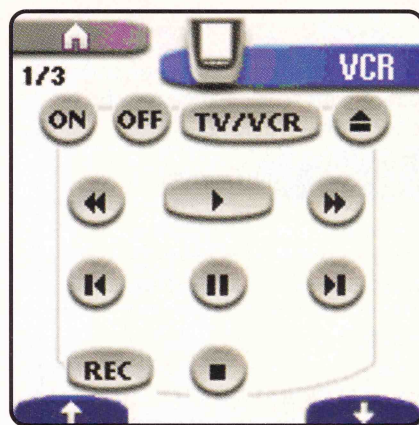
After running them through their paces, we can say this: infrared range is a concern. The IR transmitter on most PDA's tops out around 10 feet or less. External IR extenders—like UltraMote Extender and Total Remote for the Pocket PC, or OmniRemote for the Palm platform—help in big rooms.



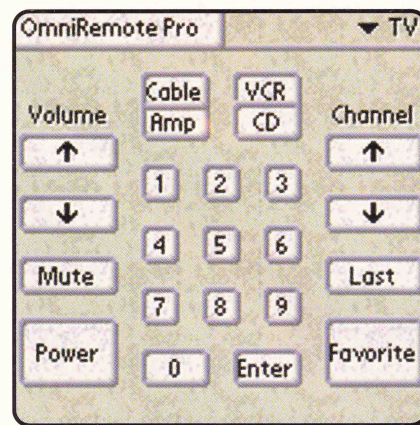




Pronto Lite mimics the look and feel of the real Pronto remote, but it lacks customization.



You can operate up to ten devices with Pronto Lite.



OmniRemote is highly customizable, right down to the button sizes and appearance.

Moreover, the essence of the remote is lost if it's off in someone's pocket when you want to operate the TV. Unless you're the only one that ever uses it, you'll want to dedicate a spare PDA for remote control duty.

## Pronto Lite

The Pronto is a household name among home theater fanatics, and Philips recently introduced a Palm OS version to whet gadget-loving appetites for the real thing. If you already have a Pronto—or at least have drooled on one at a home theater store—you may be disappointed by the lack of features in Pronto Lite. Yes, the interface looks roughly the same. But the program lacks the ability to add devices, customize the screens, or generate macros.

Pronto Lite is designed to accommodate up to 10 devices. There are standard button layouts for a pair of televisions, VCR, satellite and cable boxes, an AV receiver, CD, DVD, and tape deck. Each device has several pages of buttons. The DVD player, for instance, has three pages, with one page dedicated to play controls, another for chapter selections, and a third for navigation with a soft-button equivalent to a five-way directional pad. All this mimics the way a real Pronto works, but Philips forgot that users like to use desktop editing software to remove and rearrange buttons they're not planning to use, thus reducing the number of pages assigned to each device. The television control is six pages long—that's a lot of flipping.

The proliferation of potentially excessive pages notwithstanding, Pronto Lite has enough pre-designed buttons to satisfy most moderately-sized home theaters. The program doesn't come with any predefined IR codes, so you need to actively teach each button based on the original remote. The layouts are take-it-or-leave-it; you can't resize, move, delete, or add buttons. Nor can you create macros—and since they're the real reason to get a remote like the Pronto, consider Pronto Lite little more than a feature-limited test drive of the real thing.

## OmniRemote

Unlike Pronto Lite, OmniRemote Pro does just about everything except dust your television screen. Pacific Neotek really invented the idea of using a PDA for a remote control, and the company sells both software-only versions of

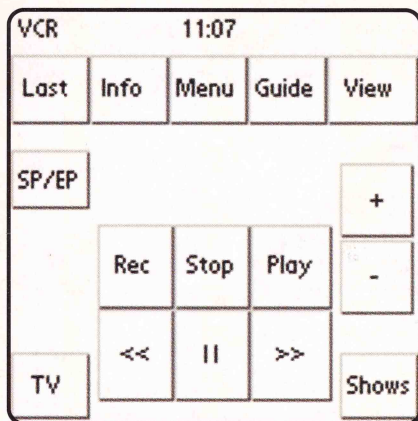
## Nevo Gets It Right

Sounds like an 80's rock band, but Nevo is actually remote control software only available on certain new Pocket PCs—like the iPAQ 3900 and 5400. Designed by Universal Electronic Inc ([www.uei.com](http://www.uei.com)) to mimic the look and feel of standalone remote controls like the Philips Pronto, Nevo is a real class act, and it may be coming to a PDA near you.

Nevo's home screen is a colorful, icon-filled ring that displays all of your home entertainment devices. Select the VCR, for instance, and the ring spins to place it center stage. Tap the device a second time, and you're whisked to a fully-configurable screen filled with buttons and controls for the device. Each device can have multiple pages of buttons, and the program's in-depth database of infrared codes means you probably won't have to teach the remote very much at all. Setting it all up is a snap; we built and tested an "appliance ring" filled with nearly a dozen devices in about 15 minutes.

But don't get the impression that Nevo is not customizable. In fact, home theater fanatics may love Nevo for its sheer tweakability. You can create custom profiles for different users, and you can have totally different "appliance rings" for each room in the house. A Favorites tool lets you create detailed macro commands to change channels or activate your components in a specific way. Even the appearance of each button is easily editable—from a bank of pull-down menus. Hats off to Nevo: we found that it's nearly good enough to replace a \$500 standalone remote, and it's almost worth buying a new iPAQ just to get this little program.





The connected.tv interface is stark, but it allows you to control your most important home theater video devices.



Connected.tv lets you see what's on and change to your favorite TV show with just a flick of the stylus.

OmniRemote as well as infrared enhancers for several Palm OS models. The latest version of OmniRemote shows an impressive level of sophistication.

The program starts you out with a handful of pre-designed devices. But the program's power is its ability to create completely new devices from a blank slate, where you add buttons to suit your vision of how the remote should work. You can add, edit, resize, and drag buttons around the screen, as well as use special icons for common features like VCR controls. You can also resize text and customize background colors and button behavior from simple pick lists.

The program's real power comes into play when you want to automate your home entertainment system. Macros let you perform a number of actions with a single button. You can fine-tune your macros by inserting pauses between actions, though you can't rearrange the order in which your macro executes. OmniRemote also has a clever timer

feature—if you leave the PDA pointing at your home entertainment system, you can program OmniRemote to leap into action and perform macros at a certain time of day.

We found the default buttons too small, and OmniRemote doesn't support multiple pages per device. Nevertheless, OmniRemote is the best remote control the Palm OS has to offer. One suggestion for Pacific Neo-Tek: the screen design process is cumbersome. A Windows-based

editor would make it much easier to tweak your remote.

## Connected.tv

Connected.tv is unique: not only is it a remote that controls your TV, VCR, and TIVO, but the program stores a complete TV guide in your PDA. That means you can scan your options and change to a specific show with the stroke of a stylus—great especially if you don't already have an on-screen guide from a service like satellite TV or TIVO.

There's nothing particularly elegant about connected.tv's looks, though. The non-editable interface relies on a densely-packed grid of rectangular buttons on a plain white background—if you didn't know better, you might think you were in a database application.

The program's real forte is the channel guide, though. For \$30 per year, you get access to a vast array of television guide

	Pronto Lite	OmniRemote	Connected.tv
<i>Manufacturer</i>	Philips	Pacific Neo-Tek	ConnectedMedia Corporation
<i>URL</i>	www.pronto.philips.com	www.omniremote.com	www.connected.tv
<i>Price</i>	\$19.95	\$24.95	\$29.95/year
<i>Operating System</i>	Palm OS	Palm OS	Palm OS
<i>Pros</i>	<ul style="list-style-type: none"> <li>Attractive layout</li> <li>Generous collection of buttons</li> </ul>	<ul style="list-style-type: none"> <li>Highly customizable</li> <li>Works with infrared adapter for some Palm models</li> <li>Macros and timers</li> </ul>	<ul style="list-style-type: none"> <li>Channel guide info on your PDA</li> </ul>
<i>Cons</i>	<ul style="list-style-type: none"> <li>Not customizable</li> <li>No macros</li> </ul>	<ul style="list-style-type: none"> <li>Default buttons too small</li> <li>Cumbersome button editing</li> </ul>	<ul style="list-style-type: none"> <li>No button customization</li> <li>No macros</li> <li>Channel guide files are huge</li> </ul>
<i>HHC Rating</i>	<b>C+</b>	<b>A-</b>	<b>B</b>

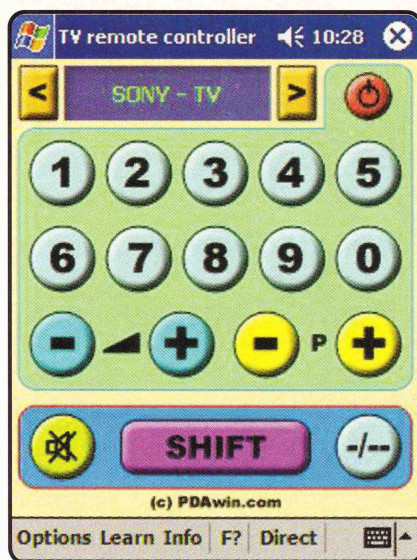


information—local channels, national networks, cable, and satellite. You set up your guide preferences on the connected.tv Web site, where you can choose exactly which stations to include in your guide, then download a few days at a time. You'll probably want to use this program with a memory card, since we found that just four days of schedule information consumed nearly a megabyte. Two weeks of data was three megabytes!

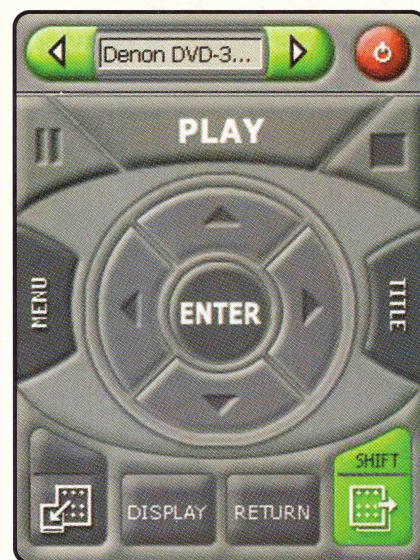
Once on the PDA, the guide lets you browse shows by categories that include comedy, action, drama, music, documentary, and more—about 80 categories over eight pages. These categories can't be organized to your personal taste, so you may have to flip a lot of pages to find your favorite house and garden programming. You can also promote shows to "favorite" status, which places them in a special, easy-to-find category. It's a nice first try, but the interface needs a makeover by someone with a sense of style. Throw in some customization tools, and connected.tv could be a winner.

## TV remote controller

There's no doubt that PDAwin.com's TV remote controller sits at the bleeding edge. Not only does it offer a slew of predefined devices (just select one and start controlling) but you can also teach the remote new commands and use custom skins to



The TV remote controller's eye-popping color interface is complemented by voice recognition.



Total Remote has a gorgeous, yet highly-functional full-screen mode.

design your own button layouts. And then there's voice recognition—this is the only remote we've found that lets you verbally tell your remote what to do.

The TV remote controller's biggest shortcoming is an alarming lack of documentation. The software supports "full-screen" operation in CCF mode, for instance. That's great, but what's a CCF? Only through deductive reasoning can you eventually figure out that CCF files are custom-designed skins.

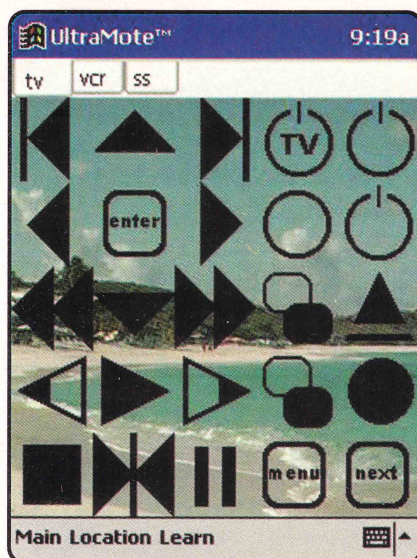
Nonetheless, this is an excellent remote for folks who just want to control a few devices without worrying about macros—something the program doesn't support. There are 38 pre-defined devices stored in the software. You can tap, or just talk: say "play the tape," or "next channel." It's a fun

TV remote controller	Total Remote	UniversalRemoteCE	UltraMote
PDAwin.com www.pdawin.com \$14.95	Griffin Mobile www.griffinmobile.com \$29.95	Pyramid Peak Design LLC www.pyramidpeak.com \$14.95	CardonWare www.ultramote.com \$30 (Extender), \$20 (software)
Pocket PC	Pocket PC	Pocket PC	Pocket PC
<ul style="list-style-type: none"> <li>Great default button layouts</li> <li>Highly configurable</li> <li>Voice recognition</li> </ul>	<ul style="list-style-type: none"> <li>Many IR profiles</li> <li>Excellent learning modes</li> <li>Clever headphone-jack IR transmitter</li> </ul>	<ul style="list-style-type: none"> <li>Easy to set up and use</li> <li>Lots of predefined IR profiles</li> </ul>	<ul style="list-style-type: none"> <li>Powerful IR transmitter</li> <li>Big, finger-friendly buttons</li> <li>Many skins</li> </ul>
<ul style="list-style-type: none"> <li>Custom skins difficult to use</li> <li>Poor documentation</li> </ul>	<ul style="list-style-type: none"> <li>Mediocre macros</li> <li>Quirky documentation</li> </ul>	<ul style="list-style-type: none"> <li>Not a learning remote</li> <li>No macros</li> <li>Not customizable</li> </ul>	<ul style="list-style-type: none"> <li>Limited compatibility</li> <li>No macros</li> <li>No IR profiles or getting-started help</li> <li>Expensive</li> </ul>
<b>B-</b>	<b>A-</b>	<b>C+</b>	<b>C+</b>

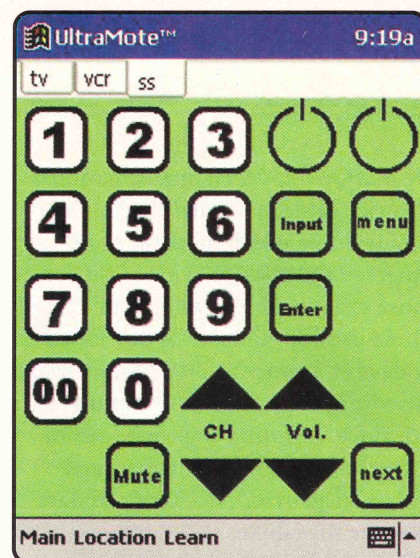




UniversalRemoteCE has an attractive interface, but a lack of expandability limits its usefulness.



UltraMote's skins and buttons can sometimes clash, but the program does give you a good assortment of options.



You can switch between your programmed devices by tapping the device name at the top of UltraMote's screen.

feature, but there are few listening remotes for a reason. We found that the software had trouble understanding us when it had to contend with background noise like the television.

If your home theater isn't represented in the controller's short list of devices, you can teach any button layout all new commands using the Learn mode, or abandon those layouts entirely in favor of one of your own. Here's where TV remote controller is at its coolest: instead of starting from scratch, you can grab button layouts from ProntoEdit, a free program on the Philips Web site designed for the Pronto. The process is complex, but the reward is a custom-designed, Pronto-like button layout on your Pocket PC.

All that adds up to a remote that gets things about half right. Clearly a labor of love, we hope that this program continues to evolve into a more usable and versatile remote.

## Total Remote

When it comes to IR extenders, Griffin Mobile has the right idea. Instead of using a semi-standard expansion slot, Total Remote plugs into the headphone jack of your Pocket PC. It should work on any Pocket PC; it ran fine on our Dell Axim.

The software is equally smart. It comes with presets for about 300 devices. Unfortunately, not a single one of our home entertainment components was on the list, so we had to train the remote button-by-button. Even that's easier than on most remotes: there are options to train one button at a time or a whole bunch at once, and you can rotate the screen 180 degrees when in learn mode so both remotes point the same way. That's one of those features that makes you wonder why no one thought of it before.

Total Remote includes a macro editor, but the documentation strangely doesn't tell you how to access your macros once you've created them. And while you can add pauses between commands, you can't edit a macro once

it's created. Despite this mediocre macro capability, Total Remote includes other thoughtful features. You can turn off the PDA's screen to conserve your batteries, yet still use the hardware buttons to control your devices. There's an attractive full-screen mode that hides the Pocket PC menu, and although you can't edit button layouts, the program accepts user-designed skins; you just need to install your own PNG-formatted graphics.

## UniversalRemoteCE

The UniversalRemoteCE from Pyramid Peak Design is a simple universal remote that doesn't have any learning capabilities, but it makes up for that with a vast library of infrared profiles—about a thousand devices in all. Indeed, it was just about the only one capable of controlling both our Denon DVD player and our Dish Network satellite right out of the box. On the other hand, there was no profile to operate our Denon AV receiver, which rendered the entire program more or less useless for our living room. Bottom line: without any learning capabilities, this program either works perfectly for your home or it doesn't work at all.

This program's simplicity is its strongest asset. There's no training, no configuring, and no editing. Just choose your devices from the list and the program automatically places them in a small cluster of buttons atop the screen. To switch among your DVD, VCR, and TV, for example, just tap the appropriate button. The controls for each device are pre-designed and fully-functional right from the start. If you prefer, you can modify the role each button plays by choosing alternate commands from drop-down menus, but we never needed to mess much with that.

On the downside, this program doesn't support macros or other advanced features—it's a simple universal remote that just operates your devices—nothing more, nothing less.



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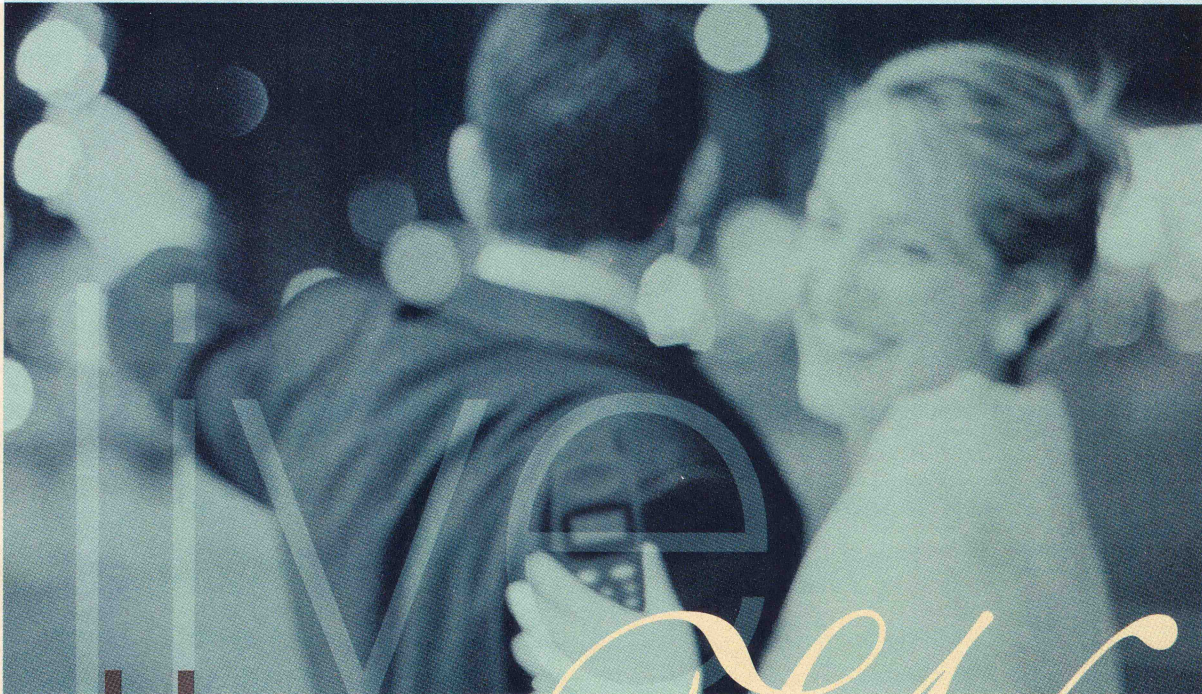
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## UltraMote

Starting out with UltraMote can be a disconcerting experience; you get a completely blank slate, with nothing on the screen but some menu options. Your first task is to create a “room” for your home theater components. Then you add devices, one at a time, and teach them button-by-button. The program doesn’t include any IR profiles or even set up an initial sample room. On the plus side, you can create multiple rooms, each with up to 25 devices.

The program comes with a variety of skins so you can customize the look of each remote screen. Some of the skins feature VCR-style controls, while others are intended for TV controls with number pads and volume adjustments. No matter which skins you choose, though, all of them rely on the same hard-coded grid of 21 buttons on the first page and an

additional 8 buttons on the second. The only way to see what a skin looks like is to add it to a device—there’s no preview—and many home entertainment systems will have devices that don’t work well with any of the included skins.

UltraMote is a pretty simple remote controller. There’s no macro command capability, and the buttons can’t be customized without resorting to new skins. The CompactFlash-based UltraMote Extender saves the day, though, delivering reliable operation even from across a large room; that’s if it works with your PDA. UltraMote only works with a handful of Pocket PCs (see the Web site for a complete list) and the Extender wouldn’t even fit in any non-iPAQ CF slot—it wasn’t long enough. UltraMote is a decent choice, though, if you happen to have the right hardware and simple needs. ♦

## Going All the Way with a Standalone Remote

If you aren’t the sort of person who thinks of the living room as a “home theater,” then you may scoff at the thought of a universal remote that costs as much as a complete desktop PC. But such devices are popular—just visit any high-end audio/video store to see for yourself. And while you can easily spend a few grand on such a device, several companies have brought audiophile nirvana down to prices a bit more fitting for the common man.

Two in particular have taken the home theater world by storm. Sony’s RM-AV3000 costs just \$199 and looks not entirely unlike an oversized PDA. A number of hardware buttons control common tasks like volume, channel changing, navigation, and device management, while a large grayscale touchscreen lets the remote display totally different button layouts for each device you need to access. The RM-AV3000 controls up to 18 devices and supports as many as 45 macro commands. An internal timer can take control of your components and run macros on a set schedule.

The Sony remote is inexpensive—as remotes go—and consequently a hot commodity at your local stereo shop. But some users dislike the grid-like button layout on the Sony’s touchscreen and want more customization options. Those folks often turn to the Pronto family of remotes from Philips. Unlike the mix of hardware and virtual but-



The Sony RM-AV3000 is quite affordable, yet it’s as powerful as some universal remotes that cost a grand.

tons on the Sony, the Pronto devices are composed almost entirely of a large touchscreen. The ProntoPro, at the top of the heap, costs a cool grand (the far more reasonably-priced grayscale Pronto TS1000 can be had for \$399) and is unique in that it’s one of the very few universal remotes available—at any price—with a 256-color display. Unlike the Sony’s 18 device/45 macro limit, the ProntoPro boasts a massive 8MB of flash RAM that allows for a huge number of devices to be programmed, with no practical limit on how many macro commands you add. Each device can have multiple pages of buttons and controls, and the remote has many special capabilities—just switching to a particular device’s page can command the AV receiver to switch to that input, for instance.

Another benefit of the Pronto: Philips offers a free Windows program called ProntoEdit that you can use to customize your button layouts on the PC screen, then download them to the Pronto. If you don’t want to muck around in all that, you don’t need to. The device comes with a comprehensive database of IR codes for popular devices by 500 manufacturers, so it can be set up quickly and easily. Not everyone needs one of these standalone universal remotes, but those that try one quickly fall in love with the power and convenience.



Philips’ Pronto family of universal remotes is the inspiration for many of the PDA-powered remote programs in this roundup.



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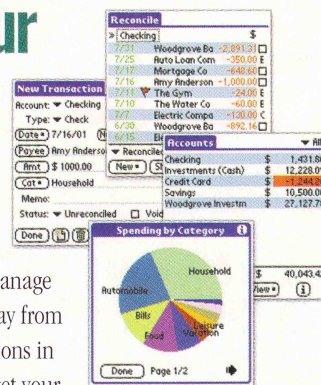
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# Reviews

## Palm Tungsten T vs. Sony Clié NX70V

### The first OS 5 PDAs square off

It's a face-off of epic proportions. In one corner, we have the Tungsten T, Palm's best handheld in years (maybe ever). Theoretically aimed at business professionals, it's a powerhouse packed with new features like Bluetooth, a Pocket PC-like navigation pad, and the Amazing Shrinking Case. In the other corner, Sony's pricey Clié NX70V represents an evolutionary but dramatic update to the NR series, with amenities like two expansion slots, voice recording, and a built-in camera that captures video as well as photos. Deciding between the two is like deciding between a BMW Z4 and a Porsche Boxster.



The Tungsten T shaves almost an inch whenever you slide the Graffiti area closed.

Both models owe many of their new capabilities to Palm OS 5, which allows them to finally break away from sluggish 33MHz DragonBall processors and take advantage of ARM-based CPUs that start at 144MHz and go as high as 400MHz. OS 5 also adds support for higher-resolution displays, wireless connectivity, stereo sound, digital voice recording, and more—all of which you'll find in these new devices.

### The Tungsten T: A Speedy Convertible

The Tungsten T is, quite simply, a breakthrough product. It's powered by a 144MHz processor and 16MB of SDRAM (with about 14MB available). It also features Palm's usual SDIO expansion slot and universal connector, so it'll work with most existing m-series peripherals. (You'll need new Tungsten-compatible drivers, however.) The Tungsten is Palm's first PDA to offer voice recording and integrated Bluetooth networking. The latter allows it to wirelessly access the Internet (via a Bluetooth mobile phone) right out of the box.

The "T" is visually striking. Taking a page from the Sharp Zaurus, Palm designed the device to slide open and shut, thereby hiding or revealing the Graffiti input area. Open, the T is 4.8 inches long. Slide it closed and it shrinks to just 4 inches—not a huge difference, but it feels amazingly small and rides effortlessly in your pocket. And don't forget about the 65,000-color, 320x320-pixel display, Palm's best ever. In side-by-side testing, we voted it better than any other Palm powered PDA except perhaps the Sony NX. One quibble: while we like the navigation pad, we actually prefer Sony's jog wheel, which affords one-handed operation and scrolling.

### The NX70V: It's the Multimedia, Stupid

The NX70V is a great example of just how much leeway PalmSource gives its partners to create unique and innovative devices. This Clié, like its NR70V predecessor, uses a swiveling clamshell flip case: open the top to reveal a laptop-like PDA complete with a small QWERTY keyboard, or swivel the screen 180 degrees and lay it down over the keyboard to use it like a slate. The display is a breathtaking 65,000-color, 320x480-pixel LCD. All the core Palm OS and Sony value-add applications have been updated to take advantage of the full screen when Graffiti is minimized, and the Clié comes with a built-in control for swapping in third-party Graffiti "skins" (see "Max Out Your Clié," Issue 5.6). The Clié's 200MHz processor delivers lightning-fast operation (though in benchmarks, the Tungsten actually performed a bit quicker).

The NX is all about multimedia. Its digital camera records images in several resolutions including 640x480 pixels (a four-fold increase over the NR's camera), and it can also record full-motion video

### Tungsten T

Palm  
www.palm.com  
\$499

Palm OS 5, 16MB, 144MHz ARM processor, 320x320 color, SD slot, rechargeable battery

#### Pros

- Clever collapsible design
- Integrated Bluetooth
- Excellent screen
- Fast!

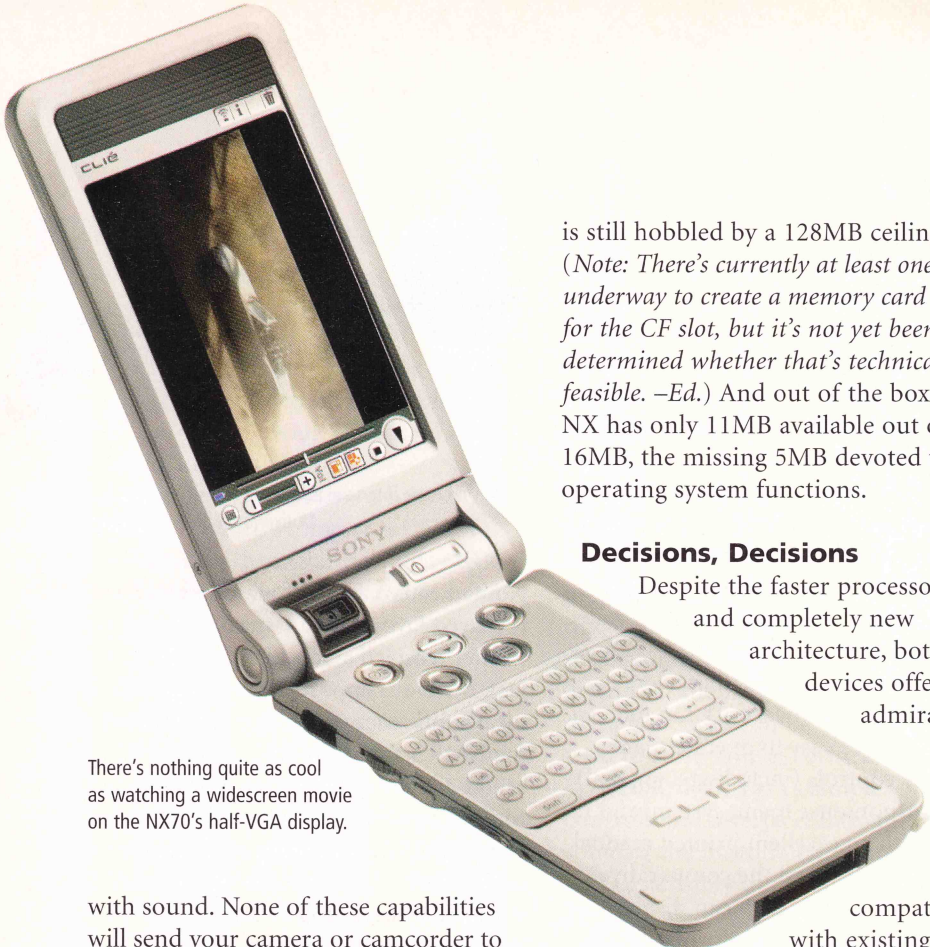
#### Cons

- Some functions inaccessible when closed
- No MP3 or video player
- No easy travel-charge option

# A







There's nothing quite as cool as watching a widescreen movie on the NX70's half-VGA display.

is still hobbled by a 128MB ceiling. (Note: There's currently at least one effort underway to create a memory card driver for the CF slot, but it's not yet been determined whether that's technically feasible. —Ed.) And out of the box, the NX has only 11MB available out of 16MB, the missing 5MB devoted to operating system functions.

### Decisions, Decisions

Despite the faster processors and completely new architecture, both devices offer admirable

with sound. None of these capabilities will send your camera or camcorder to the trash heap, but we loved being able to record everyday scenes that we'd otherwise never capture. Of course, there's also an MP3 player and digital voice recorder as well. While the popular Kinoma player wasn't fully compatible with the NX during our review period, we did manage to download the entire library of short features from [bmwfilms.com](http://bmwfilms.com) and watch them with Sony's excellent video player. It took a pair of 128MB Memory Sticks, but it was worth it.

The NX is a bit thicker than the NR, owing to the addition of a CompactFlash slot. What do you get for the extra bulk? For the moment, not much: the slot accepts only a Sony-branded WiFi card. While the card works fine—we used it at several WiFi hotspots to access e-mail and the Web—the crippled slot represents a regrettable choice by Sony to ensure customers choose their proprietary Memory Stick media instead of cheaper, higher-capacity CF cards. That's doubly unfortunate given that Memory Stick

compatibility with existing Palm OS applications. The majority of existing apps work just fine, and many vendors are busy tweaking their products to work better on OS 5. At press time, a few high-profile apps didn't work properly on either the Tungsten or NX, but updates were in the works for all of them.

The NX70V's appeal is undeniable: we loved taking pictures, listening to music, and running the bundled Documents To Go word processor on the huge screen. Sony also includes an alternate application launcher that makes heavy use of the jog wheel, but we found it a bit clumsy; we preferred third-party apps like SilverScreen or even the standard app launcher. The NX gets noticeably less mileage than the Tungsten T on a charge, though it does come with a travel-friendly sync cable in addition to the standard HotSync cradle. The crippled CF slot and limited available memory are sore spots.

The Tungsten T, on the other hand, gets almost everything right. Palm really nailed this gadget. Though it lacks out-

of-box MP3 capabilities, a free player from RealNetworks should be available by the time you read this. As for Bluetooth, there's a limited need for it right now, but we applaud Palm's efforts to grow this promising wireless market. We were able to dial our Ericsson T68 phone and access the Internet via the T without a hitch.

Even the little things count. The Tungsten T includes a more streamlined Prefs app (which didn't make it into the Clie) and a handy protective cover that snaps around back when the T is in use. Forget paper clips; you can actually use the tip of the stylus to reset your Tungsten.

If you want multimedia prowess and a gloriously spacious screen, the NX70 is the next best thing to heaven. If you want a much more compact handheld, however, or need Bluetooth today, the Tungsten T can't be beat. But whichever model you choose, you'll enjoy the fruits of OS 5 and one of the best PDAs ever created.

—Dave Johnson

### Clie NX70V

Sony  
[www.sonystyle.com](http://www.sonystyle.com)  
\$599

Palm OS 5, 16MB, 200MHz ARM processor, 320x480 color, Memory Stick and CompactFlash slots, rechargeable battery

#### Pros

- Superb half-VGA display
- Great for capturing photos and video
- Great for watching videos and listening to music
- Two expansion slots
- Extensive software bundle

#### Cons

- Expensive
- Long and bulky
- Crippled CF slot
- Mediocre battery life
- Only 11MB available

B





# reviews

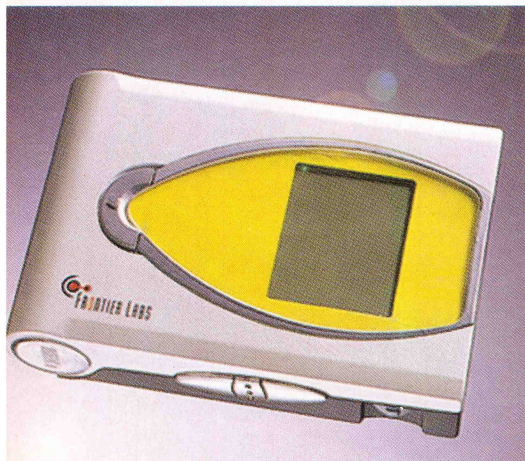
## Mini MP3 Players

### Smaller, cheaper, better—three thrifty pocket stereos

We've said it before and it bears repeating: flash-memory MP3 players have a place in the world, even if they don't store nearly as much music as hard-drive players like the Apple iPod. What's the appeal? They're small, light, inexpensive, and ideal for exercise. Plus, the latest models offer some nice perks, like built-in FM tuners and voice recorders. Look for WMA support, too, as it effectively doubles the amount of music you can pack into any given player—an important consideration when dealing with a limited amount of memory. If a player doesn't handle WMA files, it should at least have a media slot for adding more storage.

#### Frontier Labs NEX IIe

The Frontier Labs NEX IIe may not have sexy looks or a lot of advanced features, but it's a solid MP3 player with a bargain price—sort of. The unit sells for \$109, memory not included. To store songs on the NEX, you need an industry-standard CompactFlash (CF) card. Plan on spending about \$50 for a 128MB card, \$90 for 256MB or—get this—\$300+ for



It's not much in the looks department, but the NEX IIe's got it where it counts.

a 1GB IBM Microdrive. That kind of capacity makes the NEX unique among flash-memory players.

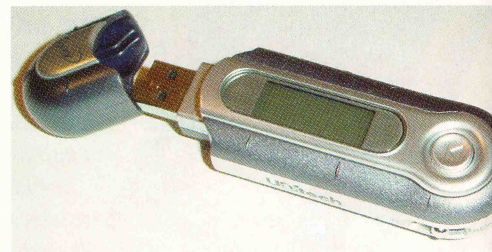
Still, to level the playing field, let's say you spend a total of \$159 for the player and a 128MB card. What you get is a unit that's bulky (exactly the size of a deck of cards) and unattractive (despite the inclusion of six "NEXkins"—swappable plastic inserts that add a splash of color to the front). On the other hand, it's easy to operate thanks to simple controls (including a jog dial) and a no-nonsense menu system, and it comes with an excellent printed manual. We particularly liked the comparatively large backlit LCD, which can display either a wealth of song information or a graphic-equalizer view. The only thing missing is a battery gauge.

Speaking of batteries, the NEX's pair of double-A's provide roughly 20 hours of playback, or 2.5-4.5 hours if you use a Microdrive. As every MP3 player should, the NEX supports drag-and-drop file management in Windows—no extra software required (though J. River's robust Media Jukebox is included). Plus, you're not limited to MP3 files, so it's ideal for transporting data—and lots of it, if you spring for a Microdrive. Frontier Labs supplies a great-sounding set of headphones, the kind that clip to the outside of your ear, as well as an unattractive—but functional—belt-clip case.

Despite its throwback design and minimalist features, the NEX IIe could prove ideal for anyone well-stocked with CF media.

#### InnoGear Duex MP-304

At first glance, you might confuse the InnoGear Duex MP-304 with either the Digitalway MPIO DMK or Creative



With a better interface and some firmware fixes, the Duex would be a contender.

Nomad MuVo, both of which we reviewed favorably in Issue 5.6 (the former received a Top Pick award). In fact, the Duex appears to represent an ideal confluence of the two devices, with the DMK's appealing tubular shape and exercise-friendly headphones and the MuVo's convenient storage-stick design: just plug it straight into a USB port—no cable required. It even ups the ante with voice recording, an LCD screen and WMA support.

Unfortunately, in every way that those two MP3 players succeeded, the Duex fails. Its primary control, a rocker switch/button, is too deeply recessed and slippery. Song titles don't appear immediately on the LCD, but instead scroll in from the right, slowing searches considerably. Worst of all, in our tests, some ID3 tags didn't display properly, and some MP3 files simply would not play. We hoped to find a firmware update on InnoGear's Web site, but instead found virtually zero Duex-related support. (Buyers should also note that the site contains some factual errors as to the Duex's features.)

The Duex also tanks as a USB memory stick, and for one simple reason: it requires its own drivers. The MuVo and RCA Lyra (reviewed below) receive a drive letter automatically when plugged into Windows Me/XP systems, as do all decent memory sticks. And because you can't even download the drivers from InnoGear, you're forced to pack the software CD when you travel.



As a voice recorder, the Duex performs quite capably. You can squeeze a full eight hours into its 128MB of memory (at the expense of other files, of course), and easily transfer voice files (which are recorded in the standard WAV format) to your PC. Sound quality proved admirably good.

InnoGear says it plans a firmware update to remedy some of the Duex's problems. In the meantime, this MP3 player/memory stick falls far short of its potential.

### RCA Lyra RD1080

The Lyra RD1080 kicks most other MP3 players to the curb. It's light and compact, yet has a roomy backlit LCD screen and an appreciably large font. It can hang from your neck or belt, thanks to an included lanyard and clip-case. Best of all, it sports an FM tuner and a Secure Digital/MMC expansion slot, so you're not limited to the 128MB of built-in memory.

To load songs on the Lyra, you have to use MusicMatch Jukebox, a popular music-management program that's great for ripping songs from CDs and building playlists. The Lyra plug-in makes file management fairly easy, but you can't get to it until you create a playlist in Jukebox.

File transfers seem to take forever, in part because of the USB 1.1 interface, but also because MP3s must be converted to a proprietary format (groan) via MusicMatch. That precludes simple dragging and dropping in Explorer, a shame given that the Lyra gets a drive letter and can be used to store non-MP3 files.

We liked the Lyra's simple controls and interface, though some of the buttons are annoyingly stiff (ostensibly to avoid accidental presses). The Lyra has six fixed equalizer modes for various kinds of music, and lets you store up to 10 radio-station presets. Radio and MP3 alike sounded superb piped through RCA's neckphones, which, unfortunately, proved uncomfortably snug after just a few minutes.



The Lyra packs just about everything you'd want into a compact, affordable player.

Still, we can live with the Lyra's few annoyances in exchange for its great features, smart design, and low price.

—Rick Broida

### Frontier Labs NEX IIe

[www.frontierlabs.com](http://www.frontierlabs.com)

\$109

No internal memory, USB, 2 AA batteries, CompactFlash slot, 4.2 ounces

#### Pros

- Easy to use
- High-resolution LCD
- Great headphones
- Supports WMA and Microdrives

#### Cons

- No memory included
- Dull design

**B**

### InnoGear Duex MP-304

[www.innogear.com](http://www.innogear.com)

\$179.99

128MB, voice recorder, USB, AAA battery, 1.6 ounces

#### Pros

- Plugs directly into USB port
- Offers basic voice recording
- Supports WMA
- Lanyard earbud headphones good for exercise
- Simple file-transfer utility

#### Cons

- Won't play some MP3 files; messes up some ID3 tags
- Primary control switch hard to use
- Hard to search for songs
- Requires special drivers

**C-**

### RCA Lyra RD1080

[www.rca.com](http://www.rca.com)

\$129.99

128MB, FM tuner, USB, 2 AAA batteries, SD/MMC media slot, 2.6 ounces

#### Pros

- Nice price
- FM radio with 10 station presets
- Expandable
- Also capable of file storage
- Comes with belt case and lanyard

#### Cons

- Some buttons difficult to press
- Requires conversion of MP3 files to proprietary format
- Doesn't support WMA

**A-**





# reviews

## Canon PowerShot S230 Digital ELPH vs. Casio Exilim EX-S2

### Digital cameras lose size—without compromise

#### Canon Powershot S230 Digital ELPH

Canon's PowerShot S230 is the latest in the successful line of tiny, pocket-sized Digital ELPH cameras that started with the S100—at one time the smallest full-featured digital camera available. While models like Casio's Exilim have stolen the lead in the size department, Canon has focused its efforts on adding features you'd expect to find only in larger cameras. The S230 is a little fella, but it can easily take on the big boys on the photographic playground.

The 3.2-megapixel S230's strongest feature is its no-compromise image quality. Packed in the tiny case is the same DIGIC image processor and iSAFS scene analysis used in Canon's high-end, \$799 Powershot G3. Give the shutter button a half-press and the camera chooses the optimal settings for your

current scene by comparing it to a database of photographic data collected by Canon over the past 60 years. Teamed with a 9-point autofocus and autofocus assist lamp, this technology does an amazing job of insuring pictures with sharp focus, accurate balance, and vivid color in a wide variety of lighting conditions. Our only complaint is with the red-eye reduction flash, which is only effective at reducing red-eye about half of the time. (This is a common problem with smaller cameras, where the flash is very close to the lens.)

The S230 is also surprisingly useful as a digital video camera. It can capture 320x240 AVI files, complete with sound, up to a whopping three minutes in length, or near-DVD resolution 640x480 videos of up to 30 seconds. The 15 frame-per-second flicks won't have you selling your DV camcorder on eBay, but with the S230 coming in at half the size of the tiniest video cameras, it's a great way to capture candid moments that would otherwise be lost to time. You'll definitely want to replace the 16MB

CompactFlash card that ships with the camera if you plan to do much filming, given that a minute of medium-res video fills nearly 10MB.

With most functions just a button press or two away, the S230 is extremely easy to use. It's also very responsive: hold down the On/Off button and the lens pops out in just over a second; turn off the LCD preview feature and you can snap 2.5 images per second. Manual features include adjustable white balance and exposure compensation, ISO settings from 50 to 400, and the ability to set long exposures of up to 15 seconds for night shots. The 2X optical (6.4X digital) zoom is quick and responsive, though we wish it had a 3X optical reach. The Macro mode can focus on objects as close as four inches from the lens.

The S230 includes a boatload of software for both Windows and Macintosh systems. Excellent

#### PowerShot S230 Digital ELPH

Canon

[www.powershot.com](http://www.powershot.com)  
\$399.99

3.2 megapixels, optical viewfinder, 1.5" TFT, 2x optical/6.4x digital zoom, CompactFlash slot

#### Pros

- Extremely compact
- High-quality optics
- Good control layout
- Shoots 3-minute movies with audio
- Excellent autofocus accuracy
- Comprehensive software bundle

#### Cons

- No audio when playing back movies on the camera
- Redeye reduction sometimes ineffective

# A+



Canon's S230 is thicker than the Exilim, but it boasts 3.2 megapixel resolution and a 2X optical zoom.



applications are included for file transfer, remote camera control, panoramic shot stitching, and other functions. ArcSoft PhotoImpression and VideoImpression are included for editing photos and videos; with the latter app, you can even transfer your S230 videos to Video CDs compatible with many DVD players. You can also connect the camera directly to a TV for photo playback.

With a no-compromises feature set and image quality that rivals full-size cameras, all wrapped up in a package you can drop into a pants pocket without thinking twice, Canon's S230 is the ultimate balance between form and function.

—Denny Atkin

### Casio Exilim EX-S2

Digital cameras don't turn heads the way they used to, but the Casio Exilim EX-S2 becomes the center of attention the moment it escapes your pocket. That's because it's so thin, so small, so freakin' slick, it immediately strikes a chord—a geek chord—in the soul of the viewer.

The awed reactions arise mostly from disbelief. How could such a tiny camera—it's the size of four stacked credit cards—take 2-megapixel photos? How could it have such a bright, spacious preview screen? And a video-capture mode? And a Secure Digital media slot (in addition to 12MB of built-in memory)?

Indeed, the Exilim's Lilliputian nature doesn't come at the cost of versatility, expandability or simplicity. A menu button and four-way joystick give you complete control over the camera's modes and settings, which include manually adjustable exposure compensation and white balance, plus a "best shot" mode with six preconfigured settings for nighttime, portrait, scenic and other kinds of shots. Our sole complaint with the physical operation of the camera is the tiny, overly touchy



Casio's Exilim is one of the smallest cameras available that doesn't trade image quality for size.

joystick. It's also a bit too easy to confuse the side-by-side power and shutter buttons, but that's a minor gripe.

The Exilim's fixed-focus lens means you're stuck zooming digitally (at up to 4x), but it also reduces shutter lag to almost zero. Plus, the camera takes only about a second to power on. This kind of delay-free shooting is ideal for a camera you keep in your pocket for spur-of-the-moment photos.

Or videos. The Exilim can capture 30-second, 320-by-240-pixel movies (which, in their native AVI format, consume about 3MB). You wouldn't use this to record, say, a high-speed Nascar race, but it's great for family gatherings and other informal settings. Alas, the EX-S2 doesn't record audio—but Casio's EX-M2 model does. It costs an extra \$100 and adds an MP3 player to the mix (it's also a hair thicker).

Both Exilims come with a small cradle that charges the internal battery and connects the camera—via USB—to your PC. Just turn the camera on while it's docked, and Casio's Photo Loader software automatically fetches photos for viewing, printing and the like. Unfortunately, this Web browser-based application left us cold with its unflattering interface, limited features and odd conventions (it refers to how many "copies" reside in each folder rather than how many pictures). Most users will prefer to drag and drop photos from the

camera to a Windows folder. Casio's far more elegant—but quite rudimentary—Photohands program provides image adjustment, sizing, and printing.

We suspected that a camera this small would snap mediocre photos at best, but the Exilim captures vivid, well-balanced images that are on par with larger, more mainstream 2-megapixel digicams. These aren't professional-caliber shots, mind you, but they're superb for a camera of this stature and intent.

In fact, we'd go so far as to say that unless you need specific features the

### Exilim EX-S2

Casio  
www.casio.com  
\$299.99

2 megapixels, optical viewfinder, 1.6" TFT, 4x digital zoom, Secure Digital slot

- Pros**
- Amazingly thin and compact
  - Shoots 30-second movies
  - Big, bright viewscreen
  - Very easy to operate
  - Powers up almost instantly; minimal shutter lag

- Cons**
- Weak desktop software
  - Touchy joystick control
  - No audio for movies
  - Requires dock for charging

**A-**





# reviews

## Dana

### Not quite a handheld, not quite a laptop—but an intriguing solution for students

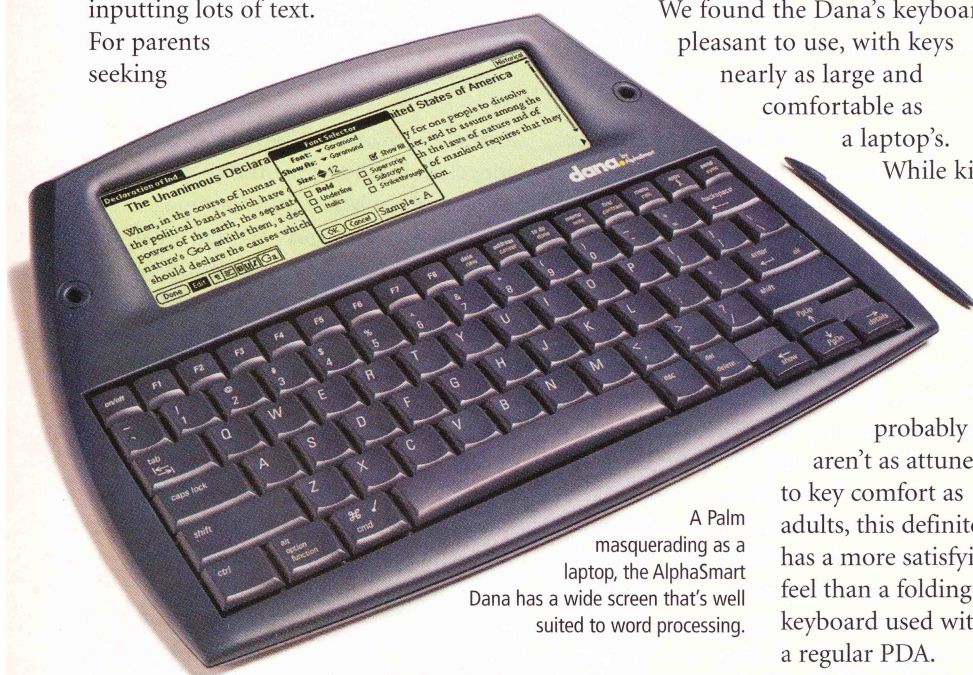
When it comes to small computing devices, we live in a world of trade-offs. Laptop computers are powerful, but they're also big, expensive and complicated. Handhelds are, well, handy, but they're not useful for chores like inputting lots of text.

For parents seeking

times wider than a standard Palm's screen, making it sufficiently broad for word processing. The Dana weighs just two pounds and measures 1.9x12.4x9.3 inches so it's much easier to tote in a backpack than most laptops.

We found the Dana's keyboard pleasant to use, with keys nearly as large and comfortable as a laptop's.

While kids



A Palm masquerading as a laptop, the AlphaSmart Dana has a wide screen that's well suited to word processing.

to outfit their kids with a school-friendly solution, the choice can be daunting.

Positioned as an inexpensive, student-oriented laptop alternative, AlphaSmart's Palm OS-powered Dana offers a new and different set of tradeoffs. It boasts the ease of use and low price of a handheld, while allowing fast, comfortable note-taking on its built-in keyboard and wide screen. And while it's neither pocketable nor as powerful as a laptop, the Dana does represent an attractive option for the school set.

The Dana sports a nearly notebook-sized keyboard beneath a slightly angled LCD. The 560x160-pixel grayscale touchscreen measures more than three

probably aren't as attuned to key comfort as adults, this definitely has a more satisfying feel than a folding keyboard used with a regular PDA.

In many ways, though, Dana is just a big Palm OS handheld. It has two slots for either Secure Digital or MMC media, so you can add memory or software cards. Its 8MB of internal RAM should suffice for most users. AlphaSmart supplies AlphaWord, a word processor that takes advantage of the wide screen, along with Quickoffice (for Word and Excel integration), Palm Reader (for e-books), and PrintBoy (for printing to IR- or USB-equipped printers). All the standard Palm OS applications have been widescreen-enhanced; third-party apps that don't support the screen appear as a box in the middle of the screen, with the Graffiti area to the right.

One of the Dana's major advantages is battery life. Its rechargeable battery can last 30 hours; in a pinch you can use three AA batteries, which will give you about 35 hours, according to AlphaSmart.

The irony of Dana is that, in solving some of the shortcomings of laptops and handhelds, it creates problems of its own. For instance, we found it useful for entering text when sitting at a desk, but lousy when there wasn't a flat surface available. That required cradling the device in one arm, while typing or using Graffiti with the other hand, both clumsy processes. Similarly, while the Dana's keyboard is wonderful, a traditional handheld and foldable keyboard take up much less backpack space and can stow away in pockets if necessary.

As a result, the Dana is brilliant for its intended purpose—students and classrooms—but not exactly ideal for most other users and settings. What's more, the device seems a bit overpriced relative to its capabilities.

—David Haskin

#### Dana

AlphaSmart, Inc.  
[www.alphasmart.com](http://www.alphasmart.com)  
\$399

Palm OS 4.1, 8MB RAM, 560x160 grayscale screen, two SD/MMC slots, rechargeable battery

#### Pros

- Smaller, far less expensive than a laptop
- Comfortable built-in keyboard
- Wide screen beats handhelds for word processing
- Long battery life
- Two expansion slots

#### Cons


- Only 8MB of RAM
- Expensive; for the same price, you could buy a color handheld and folding keyboard

# B





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Recurring transactions  
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### Mobile Access 2003

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Pictures	0 K
History	0 K
My Wallet	0 K
My Wallet	0 K

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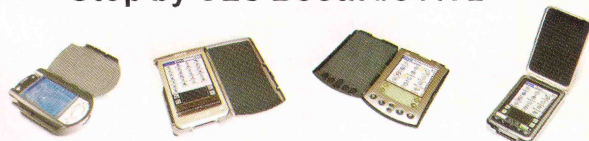
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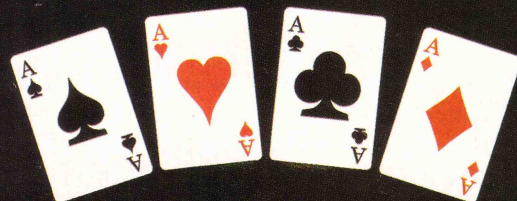
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# reviews

## Nomad Jukebox Zen

### ...and the art of music maintenance

The Nomad Jukebox Zen unabashedly follows in the footsteps of the Apple iPod, packing a whopping 20GB into a pocket-size MP3 player. How does it compare with Apple's wunderkind? That depends on whether you vote with your checkbook or your brain.

With a price tag of \$299 (after a \$50 rebate, which Creative says is "ongoing"), the Zen represents a considerable savings over the \$499 iPod. It also gives you greater control over your songs, allowing you to delete them and create playlists right on the device. The discriminating ear will appreciate the Zen's 98 dB signal-to-noise ratio and ear-covering neckphones (which were a bit tight for our tastes), which translate to more pristine-sounding audio. Creative promises up to 12 hours of playback from the rechargeable battery; the iPod quits after 10. Best of all, the Zen resumes playback after shutdown, overcoming the iPod's most annoying imperfection.

However, the Zen's superiority ends there. For starters, it's not nearly as sleek or stylish as the iPod, and despite being both larger and thicker, it has a smaller LCD screen. Eight control buttons (including, thankfully, a jog dial) reside on either side of the unit, where they're easily pressed by accident (except for the recessed power button, which is actually a bit too difficult to push). The LCD's weak blue backlight activates automatically with the touch of any control.

The Zen inherits the same painfully awkward interface used by the Nomad Jukebox 3 (see *Handheld Computing* issue 5.5), which makes navigation far more complicated than it should be—especially if you have a lot of songs. You'd think it would be a simple matter to, say, play all the songs loaded on your Zen, either in order or randomly. But it can't

do that, not unless you build a playlist first (either on the device—a tedious chore—or your PC). Ridiculous.

Equally bad is Creative's PlayCenter, a comprehensive but confusing song-management and -ripping utility for Windows. For starters, it didn't add our MP3 files to its PC Music Library list, even though we pointed it to the correct folder on our hard drive. We had to import songs ourselves, then jump through considerable hoops just to get it to read songs in subfolders.

Like the Jukebox 3, the Zen boasts USB 1.1 and FireWire interfaces—but this time, the lack of USB 2.0 support is unforgivable. It took about 25 minutes to copy 1,300 songs (4.5GB) to the device using FireWire; USB would have taken hours. And there's another fly in the file-transfer ointment: While the Zen can double as a portable hard drive, you must use Creative's File Manager software to copy files to or from it. That means you can't just plug it into another PC to access your data. In fact, the Zen doesn't even get a drive letter under Windows, a foolish oversight on Creative's part. Even the iPod—originally a Mac-only product—lets you drag and drop files in Explorer.

We're giving the Zen some hard knocks in part because it deserves them, but also because it's nowhere near as smart or elegant as the iPod—currently the standard-bearer for high-capacity MP3 players. Given the Zen's admirably

If you're willing to put up with an atrocious interface, the Zen is an MP3 bargain that's hard to beat.

low price, should we be more forgiving of its flaws? Perhaps, but it's hard to relax and enjoy the music when you're fighting the software, interface and controls.

—Rick Broida



#### Creative

[www.nomadworld.com](http://www.nomadworld.com)  
\$299 (after \$50 rebate)

20GB, USB 1.1 and FireWire,  
9.5 ounces

#### Pros

- Nice price
- Great sound
- Long-lasting battery
- Resumes playback after shutdown
- Includes belt-clip case

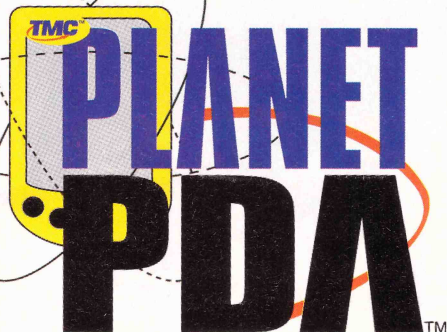
#### Cons

- Awkward controls, terrible interface, small LCD
- Doesn't support USB 2.0
- Doesn't appear as a drive when connected to PC
- Confusing desktop software and documentation

C-



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# reviews

## Presenter-to-Go

You're already schlepping a big, bulky projector to every business meeting and conference—do you really need a laptop, too? Not if you have a Sony Clié and Margi's latest version of Presenter-to-Go. This member of the PtG family is largely identical to its siblings, but with a Memory Stick interface card. It also includes an AC adapter, VGA cable, 14-button remote and Margi Mirror—a Palm OS program that faithfully recreates the Clié's screen on a monitor or projector. We tested this package on a Clié NR70V.

Copying a presentation to the Clié is as simple as "printing" it (at resolutions up to 1,024x768) from within PowerPoint. On your handheld, you can see your slides in list form or get a graphic preview of each slide. But you're not limited to slides: you can also display everything from WordSmith documents to digital images.

As for presentations, you'll find that Margi delivers the basics, but little more. You can rearrange or hide slides at any time, and make annotations right on the Clié's screen during the presentation. On the downside, the 256-color palette can sometimes cause banding, and the Clié doesn't inherit any of PowerPoint's transitions, animated elements, video or sound.



Presenter-to-Go lets you run presentations right from your Clié.

Because the MS has no extra memory, presentations must reside in your Clié's internal RAM.

We were also disappointed to find that Margi didn't update PtG to take advantage of the 320x480-pixel display available in several popular Clié models. Thus, while this iteration of Presenter-to-Go gets the job done, you'll be wishing for more every step of the way.

—Stu Hammond

**Margi**  
www.margi.com  
\$199

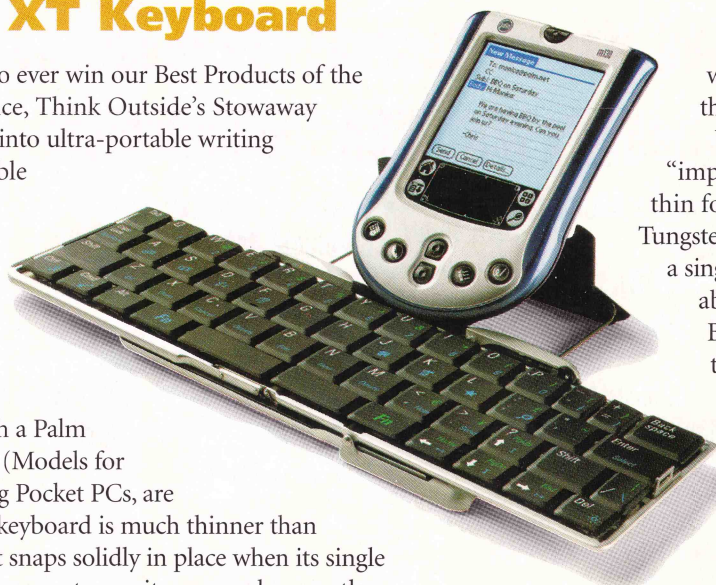
**B-**



## Stowaway XT Keyboard

One of the few products to ever win our Best Products of the Year award more than once, Think Outside's Stowaway helped turn simple PDAs into ultra-portable writing machines. It's now available in a new thinner version, the Stowaway XT, which takes two steps forward and one step back.

We tested the initial model, branded the Palm Ultra-Thin Keyboard, with a Palm Tungsten T and an m515. (Models for other handhelds, including Pocket PCs, are expected soon.) The new keyboard is much thinner than the original. Even better, it snaps solidly in place when its single hinge is unfolded, allowing you to use it on your lap or other non-flat surfaces. On the downside, the number key row is missing, requiring you to use a pair of Fn keys to access numbers or top-row punctuation symbols. Touch typists may find this slows them down—although at least it serves to keep you from overusing exclamation points. The feel of the keyboard is superb,



The Stowaway XT is also sold as the Palm Ultra-Thin Keyboard.

with a slightly deeper key throw than the original Stowaway models.

We have mixed feelings about this "improved" model. We appreciate its thin form factor—we could carry both a Tungsten T and the keyboard comfortably in a single pocket in a pair of khakis—and the ability to use the keyboard on our laps. But the missing number key row and the split space bar (with a gap exactly where the right thumb wants to tap the bar) have a negative impact on typing speed.

—Denny Atkin

**Think Outside**  
www.thinkoutside.com  
\$99

**A-**





## Photo Traveler for Pocket PC

James Bond might want to hang onto his spy camera, because PDA add-ons like the Veo Photo Traveler for Pocket PC simply aren't going to replace it anytime soon. This camera-on-a-CompactFlash-card is designed for Casio, Compaq/HP, Toshiba and other handhelds; we tested it on an iPAQ 3650. It has a rotating head that lets you shoot toward or away from yourself and captures still images at resolutions from 160x120 to 640x480 pixels. There's also a video mode: you can grab AVI movies with or without sound at a maximum resolution of 320x240. Camera controls includes a self-timer and white-balance adjustment.

So where's the problem? For starters, there are many Pocket PCs that are inexplicably incompatible, like the Dell Axim and Toshiba e550. And then there's the manual-focus lens—it's hard to adjust, and you'll end up blocking the picture with your fingers as you try to fine-tune the sharpness. Most significantly, image quality is just so-so—Bond certainly wouldn't be able to read a license plate number captured with this camera.

The software, on the other hand, is first-rate. An album viewer makes it easy to review your pictures and videos on the PDA, and the desktop apps really shine. Veo pulled out

all the stops with a suite of tools for copying images and videos between the PDA and Windows, and making movies, e-cards, and simple Web pages. The movie maker lets you combine multiple video clips, trim them, add titles and transitions, and even attach WAV soundtracks. Not bad for a \$99 camera kit. If only the camera itself had a bit more panache, this would be a keeper.

—Dave Johnson



The Veo Photo Traveler comes with its own rugged aluminum carrying case.

**Veo**  
www.veo.com  
\$99.99

**B-**



## Photo Traveler for Palm

The Palm version of Veo's Photo Traveler (see Pocket PC review, above) is mounted on an SD card, making it unbelievably small. It quickly turns any Palm OS device with an SDIO slot—like the Palm m-series, Tungsten T, and Handspring Treo 90—into a basic digital camera.

This compact camera features a manual-focus lens and swiveling base that lets you take pictures toward or away from the PDA. Both of these mechanical components are problematic; it's hard to precisely focus when the image preview lags far behind real-time, and the base has a wobbly feel that made us wonder if the camera might soon fall apart.



This first SD-based digital camera takes VGA-quality images, but feels a bit flimsy.

The Photo Traveler captures photos in VGA or QVGA mode (640x480 or 320x240 pixels). Obviously, image quality doesn't break new ground for PDAs; it's comparable to what we've already seen from products like the Eyemodule and PalmPix. A fairly slow shutter speed makes indoor photos look a bit soft, but outdoor images shot in bright sunlight are quite a bit better. The VGA images are memory hogs, though; because the camera occupies the memory slot, you're forced to store the 200K pictures in your PDA's internal memory.

Like the Pocket PC version, the Photo Traveler comes with an excellent software bundle for making videos, e-cards, and Web pages—but these components don't work as well here. The camera doesn't capture video at all, for instance, so consider the movie maker fun but unrelated. Veo got off to a good start, but the company needs to enhance image quality, speed up the on-screen preview, and give the product a more solid feel.

—Dave Johnson

**Veo**  
www.veo.com  
\$99.99

**C+**





# reviews

## PocketRadio

Hate to miss your favorite NPR shows while traveling? Tired of the same handful of MP3 files? Maybe you're just partial to the FM airwaves. Whatever the case, the iBiz PocketRadio deserves a permanent home in your Pocket PC. This diminutive CompactFlash module, which protrudes merely an inch above the slot and weighs next to nothing, turns your handheld into a full-featured FM radio, complete with 18 station presets and automatic station scanning.

Indeed, the PocketRadio software offers a nice range of features without sacrificing simplicity. An onscreen slider lets you tune in a specific frequency very quickly and easily, or you can navigate the band by tapping arrow buttons or using your handheld's control pad. (Same goes for controlling the volume, though there's no hard button for muting.)

Setting a preset requires no more than tuning in the desired station, then holding down the preset button for two seconds—just like most car radios. Best of all, the software supports multitasking, so you can perform other PDA functions while the music plays on. There's also a power-saving mode that turns off the screen but keeps the radio active.

Alas, you can't pipe the audio through your handheld's speaker—you must use the included earbud headphones



If your Pocket PC has a CompactFlash slot, fill it with this FM radio module.

(or your own favorite pair). In our tests, we found reception to be excellent and impact on battery life minimal (though a charger or spare battery is recommended).

Though pricey at \$49.99, the PocketRadio makes a great travel companion. And just in case anyone at iBiz is listening, we're eagerly awaiting Secure Digital and Memory Stick versions. Hint, hint.

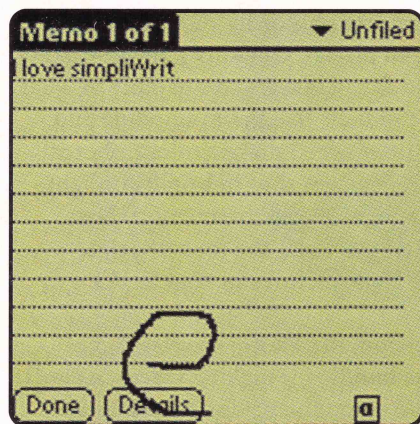
—Rick Broida

**iBiz**  
www.ibizcorp.com  
\$49.99

**A-**


## SimpliWrite



Can't get the knack of Graffiti? Ditch it for SimpliWrite, a top-notch alternative.

For most newcomers to Palm Powered handhelds, the only tough part is learning to use Graffiti. While it's an undeniably effective handwriting-recognition engine, it forces you to learn a new way of writing. Enter SimpliWrite, a highly worthwhile Graffiti replacement.

When activated, SimpliWrite supplants Graffiti with its own character set, one that's far more natural. You can dot every "i", cross every "t" and draw a "y" the way it was meant to be drawn. In short, SimpliWrite doesn't limit you to one-stroke characters.

Nor does it limit you to the Graffiti area: you can write anywhere on the screen. (This should be of particular interest to Handspring Treo and Palm Tungsten W users, as it affords handwriting recognition in addition to the built-in keyboard.) Wherever you write, SimpliWrite leaves a trail of digital ink, so you can see your characters as you draw them (important for accuracy).

SimpliWrite really shines when it comes to punctuation, banishing Graffiti's cryptic symbols in favor of the real thing. Best of all, some punctuation marks (like the period, comma and "@" sign) don't require you to enter punctuation mode first—just write them as you go.

Our sole complaint with SimpliWrite is that it doesn't offer an automatic capitalization option. Any program designed to simplify data entry should offer "instant capitals" when you write in the middle of the input area. It's for that reason alone that SimpliWrite doesn't earn our Top Pick Award.

Even so, the software has undeniable appeal. We highly recommend it for any user seeking a simpler graffiti than Graffiti.

—Kirk Linsky

**Advanced Recognition Technologies**  
www.advancedrecognition.com  
\$19.95

**B+**





# Age of Empires

## The greatest threat your Pocket PC's battery has ever faced

Microsoft's Age of Empires ranks among the top real-time strategy games of all time, so it was with considerable excitement that we fired up ZioSoft's Pocket PC version of the desktop classic. Never mind that it chews up a whopping 15MB of RAM and costs as much as some brand-new PC games (admittedly, you also get the Rise of Rome expansion pack). We could handle any flight delay, waiting-room boredom, or three-day weekend with a game like this installed.

AOE, in case you're not familiar with it, starts you in the Stone Age with a small group of peasants. It's your job to expand the tribe, gather resources, build your town, amass an army, and, ultimately, advance through the ages. Of course, the presence of up to seven computer-controlled players can make for some mighty challenging god-work.

ZioSoft's port looks and plays exactly like the desktop version—everything from the menus and game options to the sound effects and music. Even the interface is the same, save for the smart addition of a right-side button bar that gives you quick access to some commonly needed tools (like finding idle villagers and selecting unit groups). In short, it's the original AOE shrunk down to fit in your Pocket PC. Controlling the game is surprisingly easy, thanks to smart use of landscape screen orientation (either direction, so it accommodates both righties and lefties) and the D-pad (used for scrolling). Most impressive of all, the game didn't slow down even when there was a lot of action onscreen (and this on a non-XScale iPAQ 3850). However, given the relatively low resolution of a Pocket PC's screen, it can be difficult to make out some of the game's smaller map elements

(“Hmm, is that a berry bush or a small tree?”).

AOE consists of three components, each installed separately. The main game, which consumes 8.1MB of RAM, allows you to play the Random Map and Death Match modes. You'll need to sacrifice another 6.5MB to load and play the game's eight campaigns, and 1.2MB for its two dozen scenarios (again, all the originals from Age of Empires and the Rise of Rome expansion). You can also install home-built campaigns created on your PC. You can delete individual campaigns and/or scenarios if you need to reclaim storage space. We installed everything on a memory card and the game ran just fine.

Unsurprisingly, ZioSoft chose not to include any multiplayer options. In an ideal future, we'd love to link up with one or more human opponents via Bluetooth, Wi-Fi, or even 3G, but that's just not yet realistic. Besides, a multiplayer game of AOE can take hours, which presents both battery and logistical issues. No points lost for making this an exclusively single-player outing.

If we have any complaint with AOE, it's the claustrophobic feel that comes from playing it on such a relatively small screen. As with SimCity, the game involves a ton of scrolling, and useful as the D-pad is, it's no mouse. What's more, why didn't ZioSoft skip right to Age of Empires II, the even-better sequel?

Nevertheless, Age of Empires represents a tremendous achievement in Pocket PC gaming, an extremely



Now appearing on your Pocket PC: one of the all-time great real-time strategy games.

playable and enjoyable mobile version of a desktop classic. Look out, addiction, here we come again.

—Rick Broida

**Age of Empires**  
ZioSoft  
[www.ziosoft.com](http://www.ziosoft.com)  
\$29.95



### Pros

- A perfect port of the desktop original
- Surprisingly easy to control
- Campaigns and scenario installation is optional
- Plays quickly and smoothly, even on last year's models

### Cons

- Steep memory requirement
- Some of the smaller in-game elements are hard to identify
- Problems resuming game after power-off

**A-**

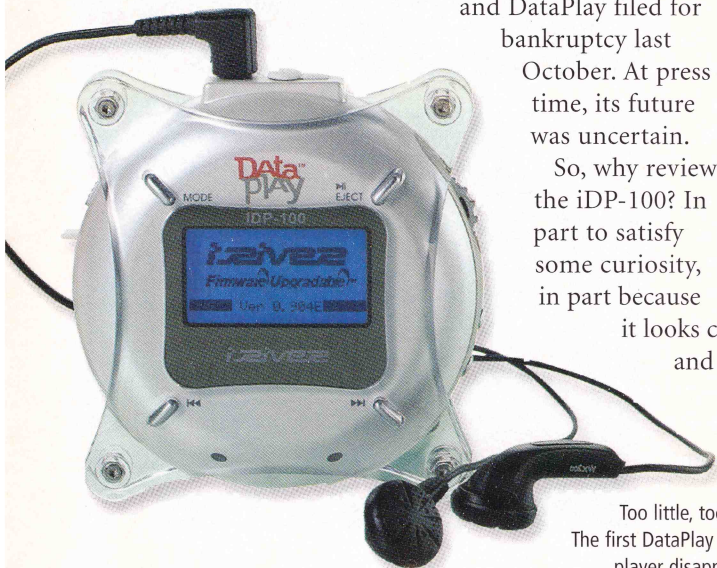




# reviews

## iRiver iDP-100

The iRiver iDP-100 is the world's first MP3 player to utilize DataPlay media—tiny 500MB optical discs that, upon their announcement several years ago, promised to revolutionize mobile storage. But the technology took too long to develop,



and DataPlay filed for bankruptcy last October. At press time, its future was uncertain.

So, why review the iDP-100? In part to satisfy some curiosity, in part because it looks cool, and in part

Too little, too late. The first DataPlay music player disappoints.

because iRiver tells us they have a warehouse full. In other words, if you want one, they're available. Will you want one? Read on.

First, the media: each cute little DataPlay disc costs about \$10 and has a write-once capacity of 250MB (about 60 songs) per side. iRiver claims each disc can hold 17 hours of music, but their math doesn't hold.

Next, the player: the iDP-100 looks slick and comes with a carrying case and removable belt clip. A jog wheel controls almost every aspect of the interface, which can be confusing at first but affords just about every playback and customization option you could want. Unfortunately, the large, crisp LCD lists only four songs at a time when it could easily show eight. What's more, the 1,000mAh battery is good for only a few hours of play time between charges.

On a positive note, our songs sounded terrific on iRiver's surprisingly comfortable Sennheiser earbud headphones. But given the sky-high price of the player, the write-once nature and limited capacity of the media, and the likelihood of DataPlay's demise, we strongly encourage music junkies to buy a hard-drive player instead.

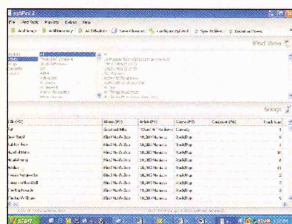
—Kirk Linsky

**iRiver America**  
www.iriveramerica.com  
\$349

**D**

## EphPod

Whenever there's a free alternative to commercial software, it's worth at least five minutes of your time. In this case the freebie is EphPod, a Windows front-end for Apple iPod users that exceeds



Maximize your iPod's potential with EphPod, a splendid freeware front-end.

Mediafour's \$29.95 XPlay at nearly every turn. It includes robust support for playlists, Audible.com files, Outlook contacts, and even AvantGo-like Web downloads (text only, of course). However, you're locked into using EphPod's somewhat convoluted (though very clean-looking) interface, whereas XPlay lets you interact with your iPod via Windows Explorer.

What's more, EphPod requires either

a Windows iPod or, if you have the Mac edition, a utility like DataViz MacOpener. That could easily offset your software savings. Still, while novice users may want to steer clear, EphPod is an excellent iPod manager with an unbeatable price.

—Rick Broida

**Joe Masters**  
www.ephpod.com  
Free

**A**

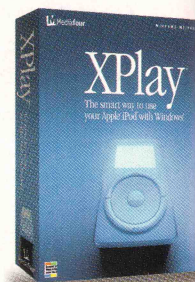


## XPlay

Apple's iPod MP3 player has earned many a deserved accolade for its stylish design, easy operation and endless storage (from 5-20GB). Though Apple now offers a Windows version of the device (along with the original Mac-only model), all Windows users would benefit from having XPlay. The utility affords the device its own drive letter, thus enabling drag-and-drop file management.

It also permits auto-synchronization, meaning that when you plug the iPod into your PC, any new MP3s on your hard drive are automatically copied to it. XPlay can find, download and install iPod firmware updates (though it doesn't notify you when updates are available), and accept vCard contacts copied from Outlook. Just one problem: EphPod does more, and it's free. Ultimately, then, you're paying \$30 for support—which may be worthwhile for less expert users.

—Rick Broida



iPod, meet Windows.  
Windows, meet iPod.

**MediaFour**  
www.mediafour.com  
\$29.95

**B**



## D-Link PersonalAir DBT-120

With Bluetooth-equipped handhelds shipping from HP or Palm, it's time to teach your desktop computer how to speak wireless. D-Link's DBT-120 offers an inexpensive language lesson. This tiny \$60 transmitter plugs into a USB port and adds Bluetooth capabilities to both PCs and Macs. It gives your computer a full suite of Bluetooth services, including a Bluetooth serial port, dial-up networking connection, network access, and more. We had no problems synchronizing a Palm Tungsten T or HP iPAQ with the DBT-120. Range was as good as you'd expect from a larger Bluetooth device—we could sync up to about five feet outside the doorway of our office. We'd have appreciated a printed manual with specific info on connecting to Palms, Pocket PCs, and phones, something the PDF documentation omits.

—Denny Atkin



This tiny USB dongle adds Bluetooth to both PCs and Macs.

**D-Link**  
www.dlink.com  
\$59.99

**B+**

## TDK bluePAQ

TDK Systems' bluePAQ is a slim, silver sleeve that adds both a Bluetooth (BT) radio and a CompactFlash slot to the iPAQ H3800 series and earlier. (It's not compatible with H3900 models.) Configuration couldn't be easier—slide in your iPAQ and the software's installed automatically, no ActiveSync required. A Bluetooth logo appears at the bottom of the screen, giving access to preferences and data exchange functions. Everything went smoothly connecting to a TDK PC Card for ActiveSync and network access, but more manual configuration was needed with a D-Link BT adapter. The software integrates BT dialing into the Contacts application. Power consumption in standby is negligible, and even in heavy use battery drain was light. The bluePAQ works well, but would benefit from detailed documentation on how to get connected.

—Denny Atkin



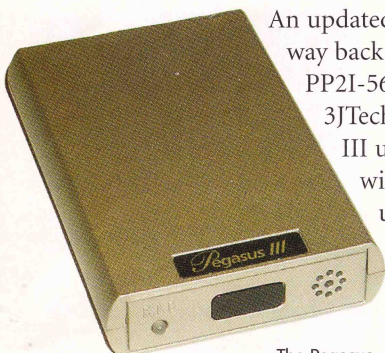
A bright blue LED in the bluePAQ sleeve shows Bluetooth activity.

**TDK Systems**  
www.tdksystems.com  
\$159

**B**



## 3JTech Pegasus III



The Pegasus modem uses an infrared connection to work with virtually any PDA.

An updated version of a product we reviewed way back in early 2000, the Pegasus III PP2I-5600B is the latest version of 3JTech's infrared modem. The Pegasus III uses the IR port to communicate with virtually any PDA. (Palm OS users will need OS 3.3 or later.) It's a great choice if there's no clip-on modem available for your PDA, or if you need a modem for multiple PDA models. A serial cable is bundled as well. The manual includes detailed instructions on configuring the

modem to work with PDAs and laptops. The Pegasus III's AC adapter can recharge the four AAA rechargeable batteries in-place. Be warned: 3JTech modems can be very hard to find; contact 3JTech to locate a dealer.

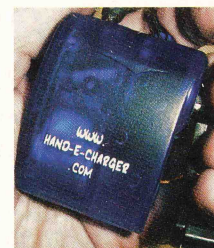
—Denny Atkin

**3JTech**  
www.3jtech.com  
\$169

**A**



## Hand-e-Charger



For the avid cell-phone user, this is \$20 very well spent.

Murphy's Law of Cell-Phone Batteries: When they die, it's always at the worst possible time. Like when you're late for an important meeting. Or stuck in a ditch during a snowstorm. That's why we're putting a Hand-e-Charger in our glove compartment and leaving it there—forever. Just spend a minute or two turning the crank on this cute translucent-blue gizmo, and your phone will have enough power for a few minutes of talk time. It even doubles as an emergency light.

We tested it with a Motorola V120c, but the company has cables for dozens of different phones. On the downside, the device is annoyingly loud when you turn the handle, and the motion gets uncomfortable sooner than you think. But those are very small prices to pay—as is the Hand-e-Charger's actual price—for this kind of convenience and peace of mind. Go ahead and die, you dumb battery. It won't stop us from calling a tow truck.

—Rick Broida

**Hand-e-Charger**  
www.hand-e-charger.com  
\$19.95

**A-**



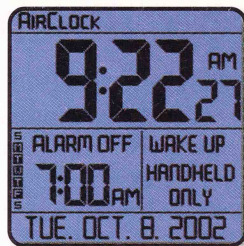


# reviews

## AirClock 2.2

Why spend 20 bucks on AirClock, a desktop clock/alarm program, when you can get Jens Rupp's classic BigClock free? In a word, infrared. AirClock not only turns your handheld into a full-featured alarm clock, it can also turn on any remote-control-equipped appliance (TV, radio, CD player, etc.) when it's time to wake up. Just leave your PDA pointing at—and in range of—the desired appliance before you go to bed. Admittedly, not many people have stereos in their bedrooms, but AirClock works great with TVs and is admirably easy to program. Indeed, simplicity is what separates AirClock from BigClock—but the latter does have extra features like a timer, stopwatch, and world clock. Plus, BigClock's free, meaning AirClock deserves your \$20 only if you like to wake up to Katie Couric.

—Kirk Linsky



AirClock can turn on the TV when it's time to wake up.

**AirSpell**  
[www.airspell.com](http://www.airspell.com)  
\$19.95

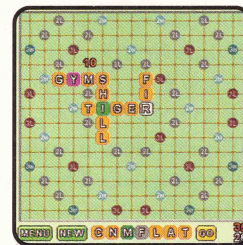
**B**



## Literati

Can't find an opponent for your favorite word game? Literati plays much like a single-player Scrabble, but here the option is simply to get the highest score possible. You place tiles on a grid that includes complete with bonus squares such as "double word" and "triple letter." Because you have no opponents supplying vowels when you get in a pinch, making words late in the game can get quite challenging. Literati has potential as a foreign language practice tool, as the 100,000-word reference file used to check the validity of your chosen words is the same as used by Beiks' spellchecking products. Spanish, anyone? Graphics are sharp, and both Clié and Palm OS 5 hi-res screens are supported. We'd love to see a multiplayer adaptation in the future.

—Cary Naismith



Literati supports Palm OS 5 hi-res displays.

**Beiks**  
[www.beiks.com](http://www.beiks.com)  
\$14.95

**B+**



## Astro Defence

Part Asteroids, part Missile Command, Astro Defence challenges you to blast tumbling chunks of rock—and the occasional alien ship—out of the sky before they pulverize your moon base. The game is mindless arcade fun: just tap-tap-tap to fire your guns, making sure to monitor their energy level so you don't run low at a crucial moment. Astro Defence's graphics are coarse but colorful (the game plays equally well on grayscale screens), with generally unexciting sound effects and not much variety to the gameplay. There's no boss level to break things up, nor even a pause between waves—it's just nonstop asteroid-smacking action. Adults will probably tire of Astro Defence in short order, but it's perfect for younger players. There's no learning curve, just lots of stuff to shoot at.

—Rick Broida



80s-era arcade action lives on in Astro Defence.

**Astraware**  
[www.astraware.com](http://www.astraware.com)  
\$14.95

**B-**

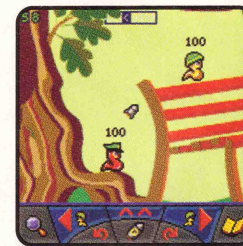


## RifleSlugs

A delightful update of the classic lob-the-bomb-across-the-map-at-just-the-right-speed-and-trajectory game, RifleSlugs puts you in charge of a slug unit armed with bazookas, rifles, dynamite, and other cleverly diverse weapons. Your goal: decimate the enemy slugs before they decimate yours. The game includes six gloriously colorful maps (elements of which can be blown away to create line-of-sight shots), three difficulty settings, and one- and two-player modes.

While RifleSlugs is enormously entertaining, there's some room for improvement. It would be helpful, for instance, to see a numerical representation of your weapon's trajectory, so you don't repeat firing mistakes. Enemy slugs seem to rely entirely on the bazooka, which makes the strategy seem unbalanced. Finally, like the original, the action gets old before too long. But the slug battlefield sure is fun for a while.

—Rick Broida



If slugs can't keep the peace, what chance does humanity have?

**Paragon Software**  
[www.penreader.com](http://www.penreader.com)  
\$14.75

**B**





## Scrabble

Who says Palm handhelds have all the fun? Handmark's Scrabble for Pocket PC has all the features of the Palm OS version, but with far superior graphics. The handheld game plays just like the boardgame, and supports 1-4 human and/or computer players. You can even play wirelessly between multiple handhelds, beaming your moves back and forth via infrared. And to satisfy those pesky "that's not a word!" challenges, Handmark supplies a built-in Official Scrabble Players Dictionary. Inexplicably, the Pocket PC version exiles a few key gameplay options (like Undo and Trade) to menus, while they appear as buttons in the Palm version. It also does a poor job of displaying scores. But those gripes aside, this is an excellent recreation of a classic game that normally doesn't travel well.

—Rick Broida



Scrabble Tip of the Day: "Zax" is legal.

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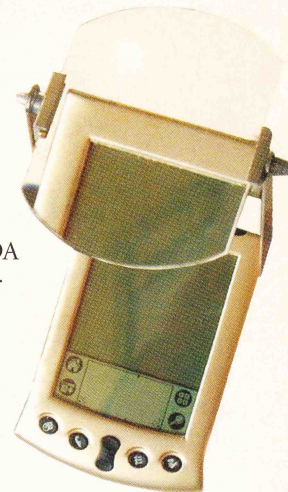


## Magnifico

Squinting to read that tiny text on your PDA screen? Office on the Go Go comes to your vision's rescue with Magnifico, a magnifier that makes your PDA's screen as readable as a laptop's. This compact lens folds up to PDA size for simple packing and carriage, adding little extra bulk to your regular travel gear. Two versions are available: one that clips onto your handheld, and a combo unit that also includes a stand for use in conjunction with a portable keyboard.

The magnifier works very well, maintaining the sharpness of onscreen text and graphics. With Magnifico attached, users with less-than-perfect vision no longer have to use typefaces so large that a single phrase fills the screen. This gadget is now one of the first items I pack when heading out of town.

—Denny Atkin, Sr.



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**A**



## Baseball Addict



Batter up! Baseball Addict hits a home run.

Baseball is hard enough to get right on a PC or game console, so Hexacto had its work cut out in creating Baseball Addict for Pocket PC. Happily, the game swings for the bleachers and gets there, with absolutely stunning widescreen graphics, terrific pipe-organ music and digitized umpire calls, and three different gameplay modes (including Homerun Derby,

which is a perfect diversion when you have just a few minutes to kill). You won't find real teams or players in Baseball Addict, which has a decidedly arcade-style design. Pitching and batting are all about timing your taps, while fielding makes smart use of the d-pad (or an onscreen diamond). We're hard-pressed to imagine a better baseball game for a handheld PC. Only the high price hits a foul ball.

—Rick Broida

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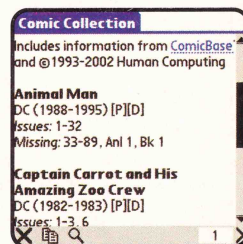
**A-**



## ComicBase Deluxe 7.0

For serious comic collectors, ComicBase is a must-have, grade-A desktop tool. This pricey but complete reference boasts cross-indexed data on over 200,000 comic issues, complete with descriptions, values, and price histories. We were as excited as Aquaman at the beach to hear that the \$149 ComicBase 7.0 Deluxe Edition's Bonus Disc includes handheld tools for viewing ComicBase databases. We were as disappointed as Green Lantern on a yellow planet to discover that handheld support is limited to viewing ComicBase's HTML reports using bundled, unregistered copies of the iSilo document viewer. We'd love a program that let you interactively check off comics as you bought them, update your collection from your handheld, and so on. For now, that's as much a dream as a world with a Superman.

—Cary Naismith



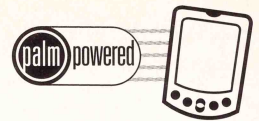
You can generate reports from ComicBase showing which issues of a comic you need, handy when shopping at The Android's Dungeon.

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**C**







## Taming the Wild Palm Powered PDA

Have you experienced a Palm pickle? A Clie calamity? A Treo tribulation? PDA Problem Solvers are on the job. Send your questions to [editor@hhcmag.com](mailto:editor@hhcmag.com) and we'll do our best to answer them in these pages.

by Rick Broida

**Problem:** I'm not too adept with Graffiti, and I don't like using the onscreen keyboard because it takes up too much space. How can I speed up my data entry?

**Solution:** Assuming you're not interested in an actual keyboard (see the Stowaway XT review elsewhere in this issue), there are several ways to improve your Graffiti speed. One of the best-kept secrets of the Palm OS world is a program called WordComplete ([www.cic.com](http://www.cic.com)), which tries to guess the word you're writing as you write it. As you input each letter, the software pops up a list of words that are the most likely matches. When you see the word you want, just tap it. Presto—the remaining letters are automatically filled in. You can even add words to the program's dictionary.

**Problem:** When I attempt to surf the Web with my Sony NX-series Clie and WL100 Wi-Fi card, the connection gets interrupted after just a minute or two.

**Solution:** Go to Prefs, then choose Network from the drop-down list. "Wireless LAN" should be the listed service; tap Details, then edit. Tap Advanced Setup, and disable PowerSaveMode by removing the checkmark. That should solve the problem. If not, see if there's a firmware update available for your Wi-Fi router/access point.

**Problem:** How can I listen to music on my Tungsten T?

**Solution:** While Palm OS 5 includes robust audio support, MP3 software didn't



Pocket Tunes for the Tungsten T

make it into the Tungsten box. At press time, RealNetworks ([www.real.com](http://www.real.com)) was soon to finish work on a free Palm OS version of its RealOne Player. You may also want to try AeroPlayer ([www.aerodromesoftware.com](http://www.aerodromesoftware.com)) and Pocket Tunes ([www.pocket-tunes.com](http://www.pocket-tunes.com)), both of which play Ogg Vorbis files (meaning you'd have to convert your MP3 files to that format).

**Problem:** I'm having trouble with beaming.

**Solution:** Assuming you're the recipient, start by heading to Prefs to make sure Beam Receive is set to On. If it is, consider your surroundings: are you in a brightly lit or outdoor area? Beaming works best in darker environments. Finally, try a soft reset (that is, press the reset

button on the back of your handheld). Nine times out of 10, that solves beaming problems. If it doesn't, have the sender reset his or her handheld as well.

**Problem:** I'm trying to lose weight. Are there any Palm OS programs that can help me?

**Solution:** There are many. Our favorite is Healthetech's BalanceLog ([www.healthetech.com](http://www.healthetech.com)), which starts by collecting personal information to help you create custom weight-management and nutrition goals. The software includes comprehensive food and exercise databases, and allows you to track calories in/out as you make entries throughout the day. Your progress is displayed on graphical charts.


**Problem:** I just came back from a trade show with a stack of business cards. Is there a quick and easy way to input the contact data into my handheld?

**Solution:** Yep, the CardScan Executive ([www.cardscan.com](http://www.cardscan.com)). This \$299 scanner captures contact information from business cards and synchronizes it directly with your PDA (most Palm OS models and all Pocket PCs are supported).



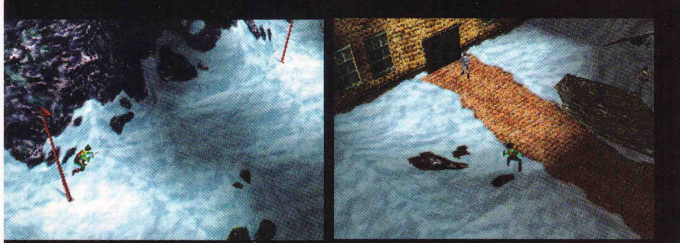
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## Getting in (Active)Sync

Is your Pocket PC acting up? Is your ActiveSync inactive? Looking for tips on how to turn it into a digital camera or a rocket tracking device? Look no further than PDA Problem Solvers! Send your questions to [editor@hhcmag.com](mailto:editor@hhcmag.com) and we'll do our best to answer them in these pages.

by Denny Atkin

**Problem:** When I try to ActiveSync my new Pocket PC, nothing happens, or I get an error. I checked, and the cradle is properly plugged into my USB hub.

**Solution:** Unfortunately, ActiveSync doesn't get along well with USB hubs on some computers. Try plugging the cradle directly into one of your computer's USB ports. Chances are that will solve the

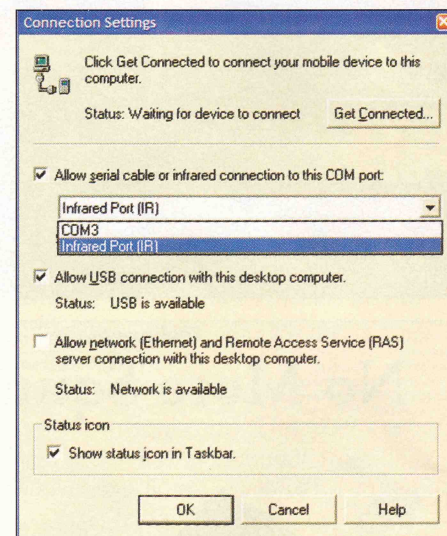
**Solution:** There are a number of alternative ActiveSync methods that can save you space in your briefcase. One solution is to use a wireless infrared connection. Open ActiveSync on your notebook, choose "Connection Settings..." from the File menu, check "Allow serial cable or infrared connection to this COM port," and choose "Infrared Port (IR)" from the menu below that selection. Now you can sync wirelessly by loading the ActiveSync application on your Pocket PC, choosing "Connect via IR..." from the app's Tools menu, and lining up the IR ports on your handheld and notebook. Note that this method is rather slow, and is most useful when just updating schedules and contacts. You'll want to use a faster method for installing programs, syncing AvantGo, or other lengthy operations.

If your notebook is equipped with a WiFi wireless networking card, adding a WiFi card to your handheld will offer you very speedy syncs. Of course, if you're using infrared or WiFi, you still have to drag along your PDA's charging brick if you'll be on the road for more than a day or so.



Seidio USB sync/charging cable

An inexpensive and extremely portable solution is to buy a USB charging and synchronization cable, such as those offered by Seidio ([www.seidio.com](http://www.seidio.com)) and SupplyNet ([www.thesupplynet.com](http://www.thesupplynet.com)). In addition to offering a speedy, wired ActiveSync connection without the bulk of a cradle, these cables draw power from your notebook's USB port to recharge your Pocket PC. Just be forewarned that the recharge rate is slower than usual, and

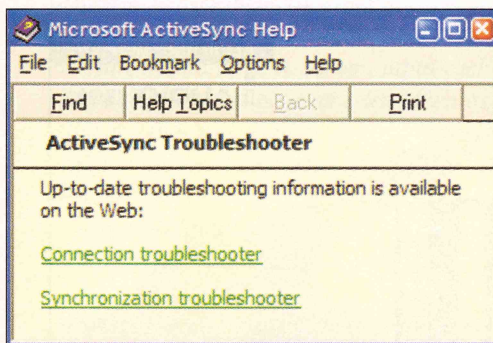


Setting up for infrared ActiveSync.

you may need to leave the handheld plugged in overnight for a full recharge.

**Problem:** I just bought a new PC and installed ActiveSync 3.6, the latest version. When I try to synchronize, it tells it can't find the driver for my USB device.

**Solution:** Install the older version of ActiveSync from the CD that accompanied your Pocket PC, then install the ActiveSync 3.6. If you don't have the original CD, some users have found installing the web download of ActiveSync 3.5, and then upgrading to 3.6, solves this problem.



ActiveSync Troubleshooter

problem and you'll be synching away. If not, open "Microsoft ActiveSync Help" from ActiveSync's Help menu, then choose "ActiveSync Troubleshooter" from the list of topics. This feature offers interactive help for both connection and synchronization problems.

**Problem:** I travel quite a bit with my Pocket PC and my laptop. Is there any way I can keep them in sync without having to haul around the bulky cradle?



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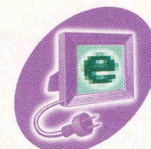
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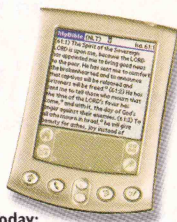
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*Continued from page 80*

scheduling and address books, but there will always be a market for a dedicated, programmable pocket-size computing device. It's that ability to install thousands of innovative programs—which makes us “think of them as computers”—that makes them special.

**Rick** Ah, I see you've discovered Dave's “someday we'll be living inside computers” theory, which he seems to think applies to PDAs as well. Wearable products—please. This guy still thinks Internet-connected refrigerators are a neat idea. Anyway, we've shared our visions of PDA Future; let's look at PDA Present. Recently we had quite the debate concerning the merits of the Sony Clie NX70V (my all-time favorite handheld) versus the Tungsten T. You two loons seem to actively dislike Sony's latest. What gives?

**Dave** Mark my words: two years from now, you'll be salivating over MP3 shirts that play 5 hours of music in the same way you have about faced on every other emerging technology we've argued about in this column for the last 3 years. Indeed, you're totally insane. How can you be so in love with the NX70V? It's thicker than the NR70V. You are always whining that this or that PDA is too thick or bulky, yet the NR is bigger than all of them! It comes with significantly less memory than the NR, forcing you to put apps on a clumsy collection of memory cards, which is problematic at best. I could go on, but I think I'll let Denny talk. I'm getting hoarse.

**Denny** I try to talk about the grand future where PDAs are super-powerful and we're all driving flying cars, and all you guys can do is gripe about what we have now? And you wonder why I usually don't hang out here on the

back page, you nattering nabobs of negativism... As far as the NX70V goes, the 11MB of memory feels like a step backwards, whatever the technical reasons for the limitation are. Sony should have found a way to do a 32MB unit. And the “crippled so as not to compete with Memory Stick” CompactFlash slot is a glaring example of what happens when specs are set by marketing departments instead of engineers. I'd buy an NX70V in a second if I could just pop my 512MB CF card out of my digital camera and view the pictures on its glorious screen. That said, I don't dislike the NX70V at all. But it is wrong to desire perfection? Now, can we get back to the future? PDA vs. smartphone. Discuss.

**Rick** Hey, pal, I may be nattering, but no one calls me a nabob! What's really unfair is that I can't address Dave's lunacy directly—not with this “Denny buffer” in the way. How could you ignore that “MP3 shirt” claptrap? “Sure wish I could listen to some music today, but my MP3 shirt is in the wash.” I predict that in the future, Dave will electrocute himself trying to transfer his consciousness to a hard drive. Or maybe a shirt. As to the question of PDA vs. smartphone—pardon me while I roll my eyes. Aren't we all just waiting for someone to create the perfect mix of PDA functionality, phone acumen, long battery life, compact size and affordable price? The closest answer today is the T-Mobile Sidekick.

**Dave** When did Denny become Jean-Luc Picard? “PDA vs. smartphone, engage!” Anyway, what you guys missed while drooling over the NX was that 2002 saw the bonafide emergence of wireless technology in the consumer market. WiFi and Bluetooth became routine components in PDAs last year, and smartphones just plain happened.

Jeff Hawkins didn't found Handspring to make PDAs; he started the company to make smartphones. It took a few years, but his excellent little Treo finally took off. So did the Sidekick, Microsoft's Phone Edition, and a handful of other communicator devices. None are really ideal yet, but they're reaching the same kind of critical mass that PDAs did in the late 90s. It's a relatively small step from pervasive wireless to my MP3 shirt.



**Denny** But when the MP3 shirt finally ships, will you be able to get it in that beloved polyester Hawaiian print? Meanwhile, the conversation keeps turning back to the past. Fine. It's because of attitudes like this that we're not driving personal hovercraft right now. Anyway, not to ruin a fun argument, but I agree that this has been a very good year for wireless. My Kyocera 7135 is amazing: a compact, full-featured PDA with high-speed net access (and no need to find a Starbucks or warchalker mark to log on), and it's a great phone too. It even works as a wireless modem for my laptop. It has everything Rick desires except for the affordable price. Give me a version with a CPU fast enough to display full-motion video and a 1GB SD card and I can stop buying new PDAs every six months.





**Rick** Actually, I could live with the Kyocera's price if it had a high-resolution screen, which I now consider mandatory. Too bad—everything else is just about perfect. But if I can go back to ragging on Dave for a moment: WiFi and Bluetooth became “routine components” in “consumer market” PDAs last year? Someone needs to up your medication, man—or maybe lower it. The Toshiba e740 and Palm Tungsten T—both business-class PDAs—have built-in WiFi and Bluetooth, respectively. That's two models out of, what, 30 introduced last year? WiFi definitely took off in 2002, but not so much in PDAs as in notebooks and networks. Bluetooth barely got out the door of the lab, and at the end of 2003, it still won't be anything more than a narrowly accepted niche technology.

**Dave** Well, Rick, you must have read the same textbook that says JFK was a Republican and that Sputnik was a nuclear-powered hot dog. As I recall, Compaq also offered Bluetooth in several iPAQs, like the 3800, 3900, and 5400. And just because you claim something is “business-class” doesn't make it so, dude. What, exactly, makes it a business device? All the enterprise software? No, that can't be it; there isn't any. Must be the game-friendly nav pad. Yeah, that's it. But Denny alludes to an interesting phenomenon. Wireless—through a combination of cellular and WiFi hotspot—is becoming utterly ubiquitous. Services like Starbucks aren't cheap, but there are other coffeehouses—some right here in my own town—that offer it for free. Eventually, we'll take wireless for granted, and then all PDAs will have to include WiFi just to be competitive. And then it's just a short jump to hello, MP3 shirt!

**Denny** Okay, enough of your MP3 shirt. As it appears the length of this column increases logarithmically with

each editor you add to the debate, it's probably time to start wrapping this up. So let me sum up what was cool the last year: the proliferation of wireless, the much-needed Palm OS 5/ARM update, plummeting Pocket PC prices, and the insipid *Voyager* being replaced by the somewhat better *Enterprise*. On the downside, we have: smartphones priced twice as high as most people are willing to spend, Treo communicators with no expansion slots, the lack of any standards for HotSync/ActiveSync connectors and the resulting peripheral confusion, and the fact that, with the Jornada dead, it seems no Pocket PC manufacturer is willing to include a nice, thin screen cover with their devices. (A conspiracy with LCD and/or case manufacturers?)

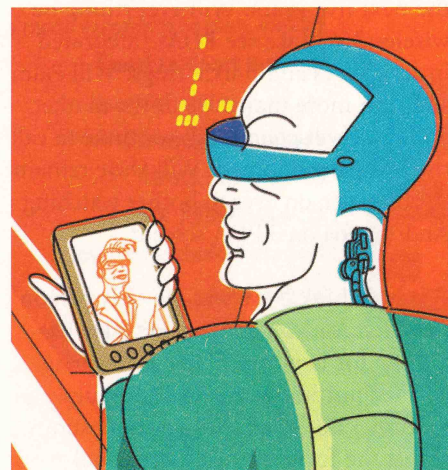
**Rick** Well, now that the gloves are off, let me just say that people who find *Voyager* insipid and *Enterprise* anything but god-awful probably consider Budweiser a premium beer and Anna Nicole Smith a role model. Ironically, these could be the same people who equate a handful of coffee-shop WiFi hotspots with ubiquity. Or who think browsing the Web on a PDA is anything but a cramped, generally unproductive, undesirable-to-most-consumers process. Okay, stand back, here comes yet another witty “Rick's been abducted by aliens” rebuttal! (Say, Denny, I've been looking for a new Head2Head partner who's in touch with reality. Interested?)

**Dave** As usual, I find myself closing with a loud, embittered sigh. All too frequently, Rick, you confuse the potential of a new technology with its here-and-now functionality. WiFi, for instance, may be the conduit that eventually delivers broadband just about everywhere, even though it's apparently not available on your own street corner yet. Intel, AT&T, and IBM recently started a new company to deliver exactly that to

public locales like hotels and retail stores, nationwide. When we talk about mobile Web browsing, you think of 160x160 pixel-screens when you should be imagining 320x480-pixel screens. Denny, at least, seems to have a little vision—but even he doesn't get to borrow my shirt. Ever. Get your own, both of you.

**Denny** Like I'd want to wear your MP3 shirt. Your clothes always have that “funny smoke” smell after those Kristin Hersh concerts. Anyway, I notice how you both almost entirely avoided the topic of this argument, the future of PDAs. I suppose I'll have to pass this column back to the two of you until the 10th anniversary, since you're obviously afraid to take me on in my topic of choice. In the meantime, I'll look forward to the my rosy future where Palm, Dell, and Sony are the three biggest PDA hardware makers; everything this side of your Nikes is wireless; there's one handheld for every three desktop computers; the market is split 65-25-10 between smart cell phones, PDAs, and wacky devices like Dave's MP3 shirt; and there's better science fiction TV than the 17th Star Trek rehash.

I'll look forward to your rebuttal in 2008!







# I've Come Here for an Argument

**As *Handheld Computing* celebrates its fifth anniversary, Head2Head celebrates its third—and invites top-dog Denny Atkin to join the madness**

**Rick** You and I have been arguing a lot longer than three years, Dave—but not on paper. So it occurred to me that in this anniversary edition of *Handheld Computing*, we should demand more pages from the boss. Sweet guy that Denny Atkin is, he agreed—as long as we granted him a spot on the soapbox. Let's see if three heads are better than two.

**Dave** My, how time flies. I can remember back to the really old days, when you argued that no one would want a color PDA. Then you said that Springboard would be a smash hit and that MP3 is indistinguishable from audio CD. More recently, you've professed the demise of the Pocket PC, Bluetooth, and kittens. Is there anything you've ever been right about? Well, let's see if Denny can beat your track record.

**Denny** How did I get dragged into this, again? Beating Rick's track record shouldn't be too hard. Wasn't he the one pontificating about an Amiga comeback a decade or so ago? But let's not dwell on the past. Instead, let's look to the future—what's going to happen over the next five years? Will everything be wireless? Will we see PDAs integrated in sunglasses and pinkie rings? Will Palm still own more than 50% of the market, and if so, will people still continue to call the company doomed? Will Dave remain the only person ever to bother watching *Andromeda* on a PDA screen?

**Rick** I think Dave was the only person to watch *Andromeda*, period. (He has a thing for lame sci-fi, like *Enterprise*, and for putting words in colleagues' mouths.) But to address your questions about the future, I think the usual

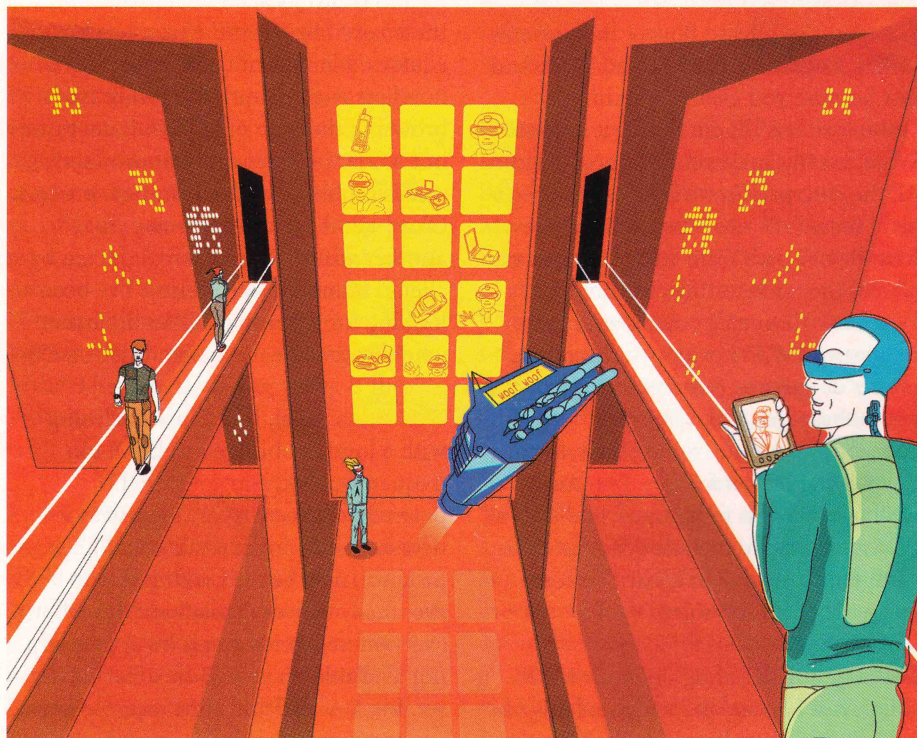
advances will apply: thinner, lighter, cheaper. On top of that, we'll eventually see the Sony NR/NX form factor take over, with handhelds that are mostly screen. We'll also see handhelds with hard drives (iPod meets Palm), because people will need a place to store those movies they'll be watching.

**Dave** Whoa, that's really going out on a limb, there, NX Boy. Thinner, lighter, and cheaper, you say? Here I thought you tried to avoid controversy and making the hard predictions. Anyway, in addition to your, err, insightful observations, I think that the PDA as we know it has a limited lifespan. PDAs were a bridge technology from semi-portable laptops to totally

pervasive, embedded technology. Five years from now PDAs will start to be in serious decline as they're replaced by wearable products that work so far in the background we'll cease to think of them as computers.

**Denny** Yeah, Dave, and the personal computer is going to be replaced by your TV set, cable box, washing machine, and toaster. At least, that's what pundits were saying a few years ago. Won't happen, because people enjoy having a dedicated "station" for e-mail, finances, gaming, and so on. In the same vein, I think something resembling the current PDA will always be around. Joe Average may use his cell phone or his iPod for

*Continued on page 78*





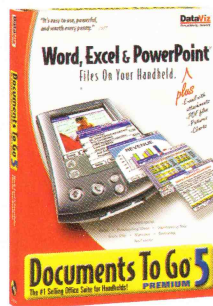
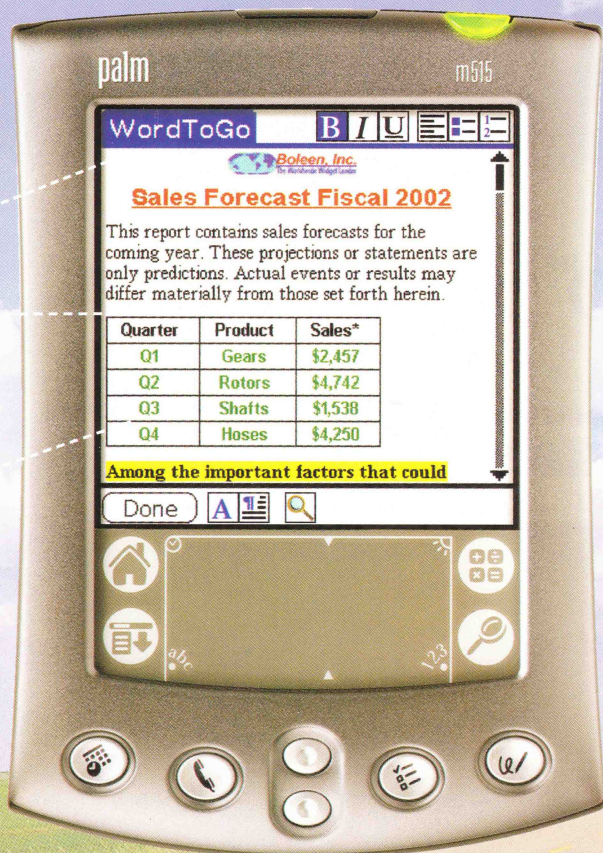
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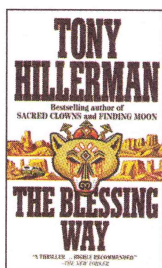
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